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OPEN-AIR SCHOOLS

L. P. AYRES



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OPEN - AIR SCHOOLS

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Also communicable
One of Chicago's open-air schoolgirls, as pictured by
The Survey

OPEN-AIR SCHOOLS

BY

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INTRODUCTION

THE object of this little book is to place before school superintendents, teachers, and others interested in educational work the essential features of present knowledge about open-air schools. It makes no claims to originality, and its material is largely taken from reports of the different schools in Germany, England, and the several American cities.

Information concerning the German and English schools has been taken largely from a report published in 1908 by the London County Council. Much of the material concerning the Providence and Boston schools in the United States is from a report entitled "Outdoor Schools," published in 1909 by the Boston Association for the Relief and Control of Tuberculosis.

In less measure other reports have also been used as sources, and the information

gleaned from them has been supplemented by means of extensive correspondence, wide use of press clippings secured through newspaper clipping agencies, and personal visits to several of the schools described.

So many persons interested in the new type of school have aided by supplying facts, records, and photographs that it is impossible to give due credit to all individually. Among those to whom special thanks are due are Dr. Gardner T. Swarts, Dr. Ellen Stone, and Miss Ellen LeGarde of Providence; Dr. Thomas F. Harrington, Miss Isabel Hyams, and Mr. Alexander M. Wilson of Boston; Dr. Henry F. Stoll, Miss Clara A. Pausch and the editor of the *Daily Courant*, of Hartford; Mr. Sherman Kingsley, Mr. Frank E. Wing, Mr. William E. Watt, and V. H. Palachek, Managing Editor of the *Examiner*, of Chicago; Dr. William H. Maxwell and Dr. Gustave Straubenmüller of the New York Department of Education; Dr. Thomas S. Carrington of the National Association for the Prevention and Cure of

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LEONARD P. AYRES.

June, 1910.

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ORIGIN AND DEVELOPMENT

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CHAPTER I

ORIGIN AND DEVELOPMENT

IN THE year 1904 there was opened in Charlottenburg, a suburb of Berlin, a school of a new type to which the Germans gave the name "open-air-recovery school." The object of the founders was to create a school where children could be taught and cured at the same time, and it is this same purpose which has actuated the founders of all of the other schools of similar type which have since been opened.

The new educational venture was a school designed for backward and physically debilitated pupils who could not keep up with the work in the regular schools and were not so mentally deficient that they were fit subjects for the classes for subnormal pupils. It was felt that if these children were sent to sanatoria they would undoubtedly improve physically, but would fall back

in their school work. If, on the other hand, they were kept in the regular schools, they would deteriorate physically.

It was to meet this need that the new type of school was devised. It was a school held almost entirely in the open air. The treatment consisted of an outdoor life, plenty of good food, strict cleanliness, suitable clothing, and school work modified in kind and reduced in quantity.

Few educational innovations have made so quick an appeal to the popular imagination as did the open-air school. During its first season the school at Charlottenburg was open for only three months, but immediately upon the publication of the report of what had been accomplished, the desire to found other similar schools spread throughout Germany. The children who had been the fortunate subjects of this first open-air experiment had made wonderful physical gains. They had increased rapidly in weight and in strength, and many who had been suffering from serious ailments had been entirely cured.

Such results as these were gratifying but

not very surprising, for it was nothing new to discover that the best sort of sanatorium treatment combining an outdoor life and plenty of good food will prove physically beneficial to those who enjoy its advantages. Such results were especially natural when the patients were growing children. But what was not foreseen and did come as a distinct surprise was that the children in the Charlottenburg school did not fall back in their school studies although they spent less than half as much time on school work as did their companions in the regular schools. They not only fully maintained their school standings, but rather surpassed their companions in the regular classes.

It was these reports of combined physical and mental benefit that spread at once throughout Germany and caused the school authorities of other cities to begin the erection of open-air schools. In less than three years the movement had spread to England, and in 1907 London opened its first school. The results obtained during the first season were as remarkable as those reported three years previously from the suburb of Berlin.

Again the accomplishments of the new type of school awakened popular enthusiasm, and towns and cities in different parts of Great Britain began to plan for other similar establishments.

Meanwhile the movement had spread to America, where the first open-air school was established in 1908 by the city of Providence, Rhode Island. Although the Providence school is the first American school of the type originated in Charlottenburg and which we are here considering, it was not strictly speaking the first open-air school established on American territory.

So far as can be learned, the first such school under the American flag was built in the city of San Juan, Porto Rico, in 1904, by the author of the present work, who was at that time superintendent of schools of the Porto Rican capital. The school in question was an experimental building made to accommodate one hundred children. It had a floor and roof, but no sides. Venetian blinds were provided to keep out driving rain and too direct sunlight. This school was designed for children of



Folk-dancing in Franklin Park School, Boston



A class in basketry, Boston

no particular class, but was built in the endeavour to demonstrate that the treatment which has proved beneficial for weak and ailing people will also benefit strong and normal children.

The results demonstrated the correctness of the proposition. The children greatly preferred the outdoor classes to those in the regular school buildings, and there were always on file applications from teachers who wished to be assigned to the outdoor work. At least one other open-air school has been built in Porto Rico because of the success of the first experiment.

Coming back to the United States, we find Boston following the lead of Providence and during the month of July, 1908, establishing a "school of outdoor life." In January of the same year New York opened its first school of the new type on an abandoned ferry-boat. During the next summer Chicago opened its first outdoor school and has since continued the work. Hartford, Rochester, and Pittsburgh have also taken up the movement and are operating open-air schools.

It is now realized in several of these cities that the movement is past the experimental stage and is to be reckoned with as an established feature of educational practice. The educational authorities of Boston have adopted a resolution providing that each new schoolhouse built in that city shall have at least one open-air classroom. New York City has taken a somewhat similar action, and is at the present time remodelling twenty classrooms in different buildings so that they can be used for open-air classes.

It has been said that the two greatest discoveries of recent times are the value of children and the virtues of an open-air life. It is questionable whether we should all agree in according preëminence to these two so-called discoveries, but there can be no question that there has been in the last few years a wonderful public awakening along both of these lines.

This may account for the enthusiastic reception which has been almost universally accorded to the open-air school. It is an educational innovation that combines

within itself a new kind of particularly effective work for children and an appealing object-lesson in the beneficial results of the outdoor life.

It is entirely too soon to prophesy what the future of the open-air school may be. That many such schools will shortly be in operation is a foregone conclusion, and that their effect on educational progress will be far-reaching seems almost as sure. Just what this effect will be, none can foretell, but it seems not improbable that the open-air school will be recognized by future historians of education not merely as a therapeutic agent, but rather as marking one long step toward that school of the future in which the child will not have to be either feeble-minded or delinquent or tuberculous or truant to enjoy the best and fullest sort of educational opportunity.

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OPEN-AIR-RECOVERY SCHOOLS IN GERMANY

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CHAPTER II

OPEN-AIR-RECOVERY SCHOOLS IN GERMANY

EARLY in the year 1908 the London County Council published in the same pamphlet a report of the work of the open-air school conducted at Bostall Wood during the summer of 1907 and a report of the Council's educational adviser on the open-air schools of Germany. It is from this latter report that the following description of the German schools is largely taken.

Medical inspection of schools has been carried on in a very thorough and efficient manner in Germany for the past fifteen years. This has drawn special attention throughout the Empire to backward children. These children are treated in special classes and sometimes in special schools. The quantity of the instruction given them is reduced, and every endeavour is made to

keep, and even to increase, its quality. The classes are taught by the most capable teachers, and the children are specially favoured in such hygienic instruction connected with the schools as baths, meals, and holiday homes. Under this treatment the children improve so rapidly that the majority of them can, in the course of a few weeks, be passed back into the ordinary schools.

In the year 1904 there were in Charlottenburg, a suburb of Berlin, a large number of these backward children who were about to be removed from the ordinary elementary schools to special classes. Upon examination it was found that many of them were in a debilitated state owing to anæmia and to various ailments in incipient stages. This circumstance afforded an ideal opportunity for the coöperation of the educator and the school physician, and to meet the need a new type of school was devised. This was the open-air-recovery school. Its province was to carry on the instruction of the children with the help of improved methods and surroundings, and at the same

time to endeavour to cure or better the ailments from which they were suffering.

The open-air-recovery school as first developed in Charlottenburg is a new type of school modified to meet the educational and physical needs of sick children. The school physician insists upon open-air treatment, pleasant and hygienic surroundings, careful supervision, wholesome food, and judicious exercise. The teacher modifies the ordinary school work to meet the new conditions. The hours of formal teaching are cut in two, and the classes are so reduced that no teacher has more than twenty-five pupils in charge. Moreover, the character of the work is modified. All that is not truly essential is omitted, and every endeavour is made to utilize the many opportunities afforded by the close contact with nature which is the ever-present characteristic of the school.

In Charlottenburg a suitable place for the school was chosen in a large pine forest on the outskirts of the town. The sum of \$8,000 was voted by the municipality for carrying out the experiment, and primi-

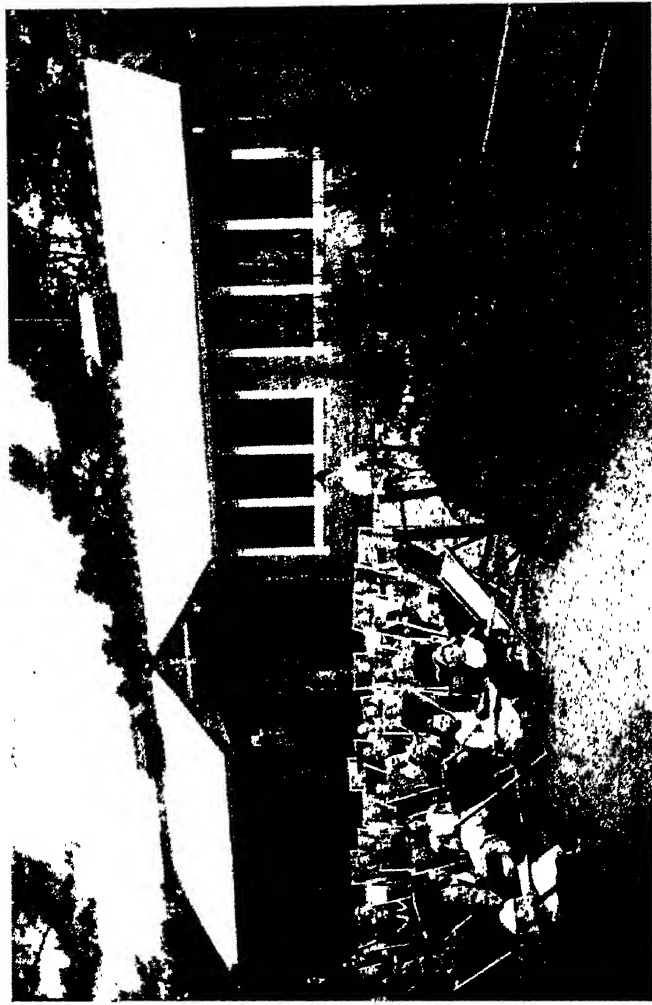
tive but suitable wooden buildings were erected.

At the outset, ninety-five children were chosen, and this number was afterward increased to one hundred twenty, and still later to two hundred fifty. These children were mainly anæmic children and those suffering from lighter forms of pulmonary, heart, and scrofulous diseases. Children suffering from acute or infectious diseases were rigidly excluded.

Five main buildings were erected. Three of them are plain sheds about eighty-one feet long and eighteen feet wide. One of these is completely open on the south side, and closed on the other sides, and provides accommodations during rainy weather for about two hundred children during the afternoon period of compulsory rest. The two other sheds contain five classrooms and the teachers' room. These two buildings are closed in on all sides, provided with heating arrangements, and are only used for instruction in very cold and unpleasant weather. They are both portable buildings. In the classrooms, instead of desks,



The first open-air-recovery school — the Forest School at Charlottenburg, Germany



The München-Gladbach School, showing veranda classroom for wet weather

simple tables and chairs of different heights and sizes are provided. The last two of the five buildings are very large sheds open on all sides and fitted with tables and benches. They are intended for meals and for work during rain or too bright sunshine.

All over the school area, which is fenced in, there are small sheds open on all sides and fitted with tables and benches to accommodate from four to six children. They serve, like the larger sheds, for writing or reading during too much sunshine. There are small buildings for shower baths and the kitchen, and a shed where the wraps of the boys and girls are kept. In these sheds there are also individual lockers which contain, among other things, numbered rugs for protection against cold, and waterproofs for protection against rain.

The children arrive at the school a little before eight o'clock in the morning. Those who live near come on foot, and the others come in special electric cars. Upon their arrival the children receive a bowl of soup and a slice of bread and butter. The classes commence at eight o'clock with an

interval of five minutes after every half-hour of teaching. The instruction is reduced to the most necessary subjects and is never given for more than two consecutive hours. At ten o'clock the children receive one or two glasses of milk and another slice of bread and butter. After this they play about, perform gymnastic exercises, do manual work, or read. Meanwhile the same process in the reverse order is carried on with other children who play during the first two hours and study from ten to twelve.

Dinner is served at half-past twelve and consists of about three ounces of meat with vegetables and soup. After dinner the children rest or sleep for two hours. For this purpose folding chairs and rugs are provided and absolute quiet is required. At three o'clock there are some classes, and at four milk, rye bread, and jam are distributed. The rest of the afternoon is devoted to informal instruction and play. The last meal, consisting of soup, bread and butter, is given at a quarter to seven. After this the children return home as they came,

some on foot and some in the electric cars. In the case of some of the very poor children, the municipality pays the fares, while transportation is furnished some of the others through the generosity of the street-car company.

The expense of feeding the children is borne by the municipality in the cases of those children who are unable to pay, and is defrayed in part or in whole by the parents when they are able to do so.

The work of the school physician consists first in the careful examination and selection of the children for the open-air school, and secondly in their treatment while they are in attendance. Attention is principally directed to the heart, lungs, and the general condition of the children with respect to colour, muscular and flesh development. At the end of each two weeks they are carefully weighed and measured. At the end of the open-air period they are all carefully examined and the condition of each compared with that noted upon entrance into the school.

The prescriptions of the doctor chiefly

concern such questions of applied hygiene as suitable clothing, the daily habits of children suffering with heart and pulmonary troubles, and the ordering of warm baths for anæmic and nervous children and of mineral baths for the scrofulous ones. At Charlottenburg bathing plays a very important part in the every-day life. During the first year thirty-three children received two mineral baths per week and twenty-five children two or three warm baths per week. All of the children received two or three warm shower baths each week. At the beginning and end of the term the school doctor came every day, and during the middle portion two or three times a week. He was assisted by a trained nurse.

During the first year the school was open for three months. After a few weeks a great improvement in the condition of the children was shown by their better appetite, attention, and general temperament. In nearly every case the children were greatly improved in physical condition, and a large number were pronounced cured. On the average

they gained one-half a pound each week during the entire period. Many of them increased by eight or ten pounds during the three months, and some of them by as much as eighteen pounds.

The educational results were no less remarkable. All of the teachers agreed in noticing a marked increase in the mental alertness of the children during the hours of teaching. In the great majority of cases the results of the school work were quite satisfactory. Three months after the return of the children to their various schools in town, reports by the principals showed that almost without exception the children were able to continue in a normal manner in their former classes. In other cases their progress was even more satisfactory than before their attendance at the open-air school. These results are significant and suggest pertinent inquiries as to current pedagogical methods:

No less important were the improvements noted in the moral tone of the children. Their behaviour showed great improvement, especially with regard to order, clean-

liness, self-help, punctuality, and good temper. This was the logical result of their removal during practically all of their waking hours from the influences of street life to those of more wholesome conditions in the school. They were taught to regard themselves as members of a large family and were trained to assist in the work of the daily life of the community and to be helpful and considerate toward one another.

In the first year of the school the term was only three months in length. In the second year it was increased to six, and in 1906 it was continued for eight months. This carried the term up to the twenty-second of December, when there was snow on the ground. The authorities feel that they cannot carry the school on right through the winter until they have solved the question of heat. This will probably involve an extra expenditure for more solidly built schoolrooms with thick walls and better heating arrangements. When these changes are wrought, the school will probably be carried on through the whole winter.

No sooner had the reports of the first

year's work at Charlottenburg been printed than interest in the new type of school was awakened throughout Germany. In 1906 an open-air school was established by the municipality of Mülhausen, in a park with a large residence called the "Hermitage," situated in the southern portion of the town. It was purchased by the municipality at a cost of \$50,000 for the use of the school children. Much of the experience gained in Charlottenburg was utilized in the new school. During the first year one hundred children were in attendance. The daily routine did not differ greatly from that followed in Charlottenburg. The results of the work at Mülhausen have been very satisfactory, although not so comprehensive as at Charlottenburg, for the reason that the period of attendance was shorter and the records less complete.

During the same year, 1906, a school was opened at München-Gladbach near Cologne. It was established in memory of the silver wedding of the Emperor and Empress. It is situated in a pine wood some distance from the town, and consists

of a simple school building with shed attached, closely surrounded on three sides by pine trees, but with a clearing on the south side.

Gymnastic apparatus, a circular path for running, apparatus for games, and garden supplies are provided. The wooden buildings have been erected in the artistic Northern style to be seen in the Scandinavian countries. The whole expenditure for building and equipment amounts to about \$4,000.

During 1906 the school was opened from May to October, and the highest attendance (58) was reached in September. The children attended on Sundays and holidays, as well as on other days, but were given no instruction. During 1907 the experiment was tried of keeping the school open for eight months, but permitting any individual child to attend for two months only. As the school accommodates about fifty children, this new arrangement would permit of treating two hundred children annually. Moreover, the plans contemplate enlarging the school and increasing the length of attendance.

In July, 1907, a school was opened at Elberfeld, and since that time additional schools have been established at Lübeck, Dortmund, and Bückow-in-der-Mark. Berlin has voted \$75,000 for beginning work on an extensive scale, and such other large cities as Solingen, Cologne, and Aix are considering plans for beginning work. There can be little doubt that in a few years' time the majority of the large industrial towns will be provided with schools of this new type.

In Germany, the open-air-recovery school has now passed the experimental stage and become an integral part of the elementary school system. In general the school at Charlottenburg is being taken as a model on which the other schools are patterned. In all cases the principal characteristics are open-air treatment, plenty of good food, warm clothing, strict cleanliness, and expert medical and dental attention.

The keynote of the school work is constant change from work to play, reading, singing, and rest, together with constant stimulation of interest.

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OPEN-AIR SCHOOLS IN ENGLAND

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CHAPTER III

OPEN-AIR SCHOOLS IN ENGLAND

THE first open-air school in England was established by the London County Council in July, 1907, at Bostall Wood, Plumstead. This action was taken following a visit of the municipal authorities to the famous school of Charlottenburg in Germany. It was this visit which resulted in the publication of the report on the German schools to which reference has been made in the opening paragraph of the preceding chapter, and it is from the section of the same publication dealing with the results of the first English open-air school that the following description is taken.

The object of the school at Bostall Wood, like that of its predecessors, was twofold, first, to benefit physically children found to be in such poor health

that they could not profit fully by the instruction given in ordinary day schools; and secondly, to give such children special physical treatment in such a way as to prevent any educational loss. The children for whom the school was designed and who were actually chosen to attend it were unable to keep pace with the other children in school, usually attended irregularly, and were incapable of continued mental or physical exertion.

It was thought that by the alternations of mental work, rest, and organized play the children would not fall back in their school work and would make decided physical gains. This hope with respect to formal class instruction was based on the fact that there would be an opportunity in this school to have much smaller classes than would be the rule in the city schools, and that instruction would be along more practical lines and much more individual in character.

The grounds in which the school was carried on were on a well-wooded enclosure of about twenty acres. A turfed space about seventy yards in diameter, almost in

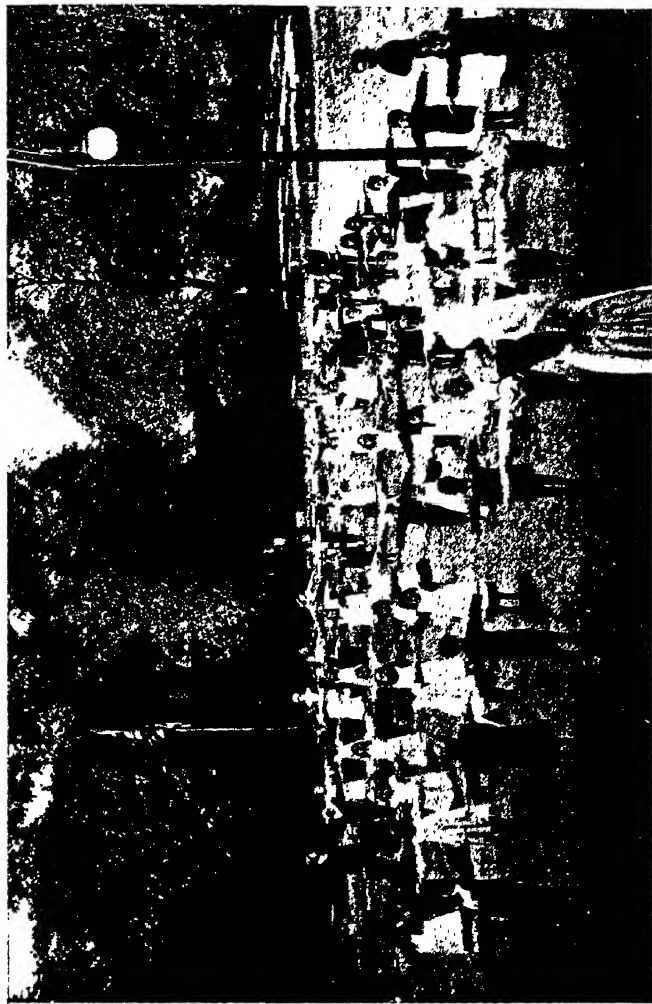
the centre of the wood, was used for the school itself. This clearing was surrounded by a single row of benches and there were two large sheds open at one side. These were used for teaching purposes and for meals in wet weather. Both instruction and meals were given outside of the sheds in fine weather.

A meeting of the head masters and head mistresses of fifty-six London schools was held at Bostall Wood early in July. The scheme for the proposed school was explained, and they were told that the number of children admitted would be limited to one hundred. In view of the smallness of the number each head master or head mistress was asked to nominate only the children most needing treatment.

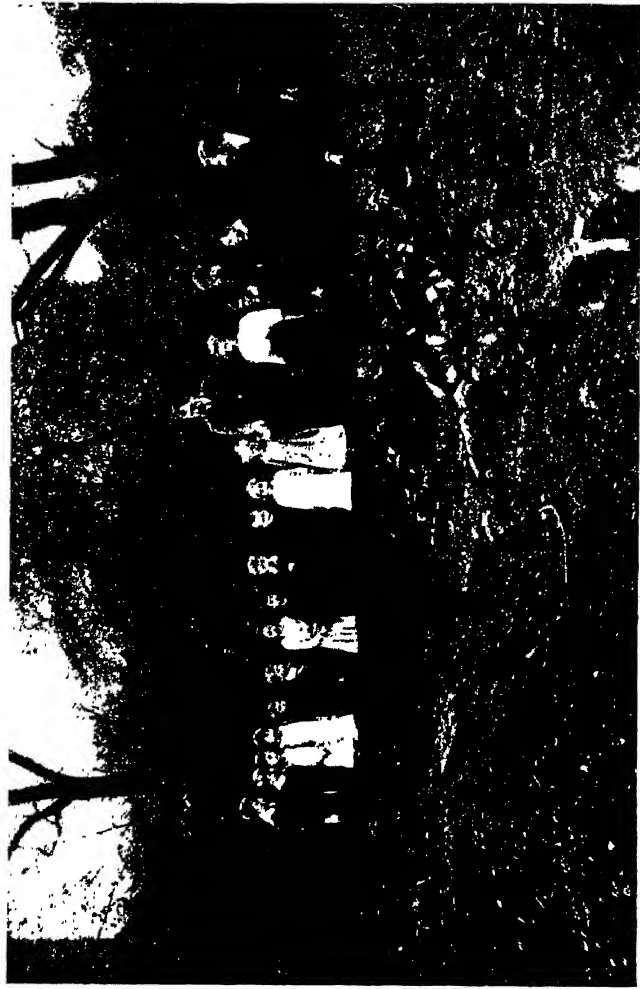
Two hundred seventy-two children were proposed by the school principals and were examined by the school physicians. Only those cases likely to benefit by attendance at the open-air school were passed. Children suffering from incurable organic disease were eliminated, and in general those admitted were debilitated and anæ-

mic children suffering from conditions of crowded city life. The children were of the type familiar to those who have much contact with city schools and congested districts. They were thin, pinched, pale and wasted, and showed in every case signs of physical enfeeblement. The children who were rejected were either too good or too bad. In all, those selected numbered one hundred forty-nine, although the greatest number on the roll at any one time was one hundred eight, and the average was a little under one hundred.

The school was kept open for thirteen weeks. The work of the school began at nine in the morning and continued until six in the afternoon on each week-day except Saturday, when there was a half-day session only. Three and three-quarters hours per day were devoted to school work. The other five and a quarter hours were given over to eating, sleeping, games, play, and wandering about in the woods. The time devoted to formal teaching shows that attendance at the school was no holiday for either teachers or pupils, but meant real



Open-air exercises at Bostall Wood



A class in practical geography, Kentish Town

hard and continued work for both, although under conditions which prevented hard work from becoming drudgery to either. The work was carried on upon practical lines as far as possible, resulting in a condition impossible to reproduce in an ordinary schoolroom. The tasks necessary in camp life afforded valuable training to those children able to take part.

The teaching staff consisted of a head mistress with two men and two women assistants. There were also a nurse and a caretaker and attendant, while the services of a school physician were regularly given. The teachers were engaged for the work on the condition that they should continue to receive their salaries as ordinary teachers, together with reasonable travelling expenses, and that after the close of the open-air school they should have their holidays and reoccupy their permanent positions.

The children attending the school were given three good meals a day. The food was prepared at a cookery centre about one-fourth of a mile from the school. A

cook and two helpers were employed, and the food was taken to the wood in order that the children might have their meals in the open air. Upon arrival at nine o'clock the children were served with porridge, syrup, and milk. At twelve-thirty they were given dinner, which was the heavy meal of the day. It consisted of meat, and occasionally fish, with potatoes, plenty of green vegetables, pudding, and fruit. At three-thirty in the afternoon biscuits and fruit were served, and at five-thirty came tea, so called, consisting of weak tea mostly milk, bread and butter, jam, and currant buns. Care was taken to serve all of the meals under the best possible conditions. The tables were decorated with flowers and there was an air of refinement and pleasure in the whole proceeding.

One of the County Council medical inspectors undertook the routine examination of the children at the school. Every child was examined in detail within four days of admission. Conditions found were registered upon the cards, and records were made at frequent subsequent visits. All

of the children were weighed and measured and results entered upon a chart on the obverse side of each child's card. A weekly record of the weight was taken by the nurse. As it is impossible to estimate anæmia accurately from mere inspection, each child was tested twice to ascertain the percentage of hæmoglobin present in the blood. The findings gave valuable data for determining the condition of children entering and the improvement resulting from open-air life, feeding, and rest.

A special feature was the provision for rest or sleep that the children were required to take for two hours in the afternoon — from one to three. For this purpose one hundred steamer chairs and blankets were provided. Twenty-five mackintoshes were also supplied for the use of the children most needing them on wet days. It was found necessary to have tents for the use of the teachers, and two of the bell type were hired from the War Office.

Through the kindness of a friend who was interested in the work, a donkey and cart were loaned for the use of the children.

This contributed much to their enjoyment and was found useful for taking the weakest of the children from the wood to the car line at the end of the day when some were too tired to make walking enjoyable.

Experience showed that it would be beneficial to have sail-cloth covers for the sides of the sheds in wet weather. It was discovered, too, that, while the steamer chairs were very satisfactory for the children to rest and sleep in, they were not at all satisfactory for study purposes.

The expense of conducting the school for thirteen weeks was met by an appropriation of \$2,000 from the Government, by contributions from friends of the work, and by payments made by the parents of the children partially to defray the expenses of the work. To keep about one hundred children in school for a little over three months cost a little less than \$3,000, or, roughly speaking, \$10 per month per child.

As to results, there can be no question that a notable success was achieved in the face of numerous difficulties. Every child attending was benefited physically by the

experience. The general improvement was great and in some instances remarkable. The general effect of the open-air life upon the children was easily discernible in their improved colour and animated demeanour. They were brighter and more full of spirits at the end of the school term than at the beginning. They moved more briskly and their intellects were keener. Physical improvement was shown by greater control over muscular and nervous movements, and the power of increased physical and mental effort. The increase of voice volume was most marked and significant. In a number of cases the eyesight of the children improved notably.

Increased resourcefulness was shown. Two of the boys painted one of the sheds in a very creditable manner, and most of them developed handiness at various manual tasks. When one of the cookery assistants left through illness, the children took up the work, and all of the necessary laundry work, washing of table-cloths, etc., was done by the children after the first week.

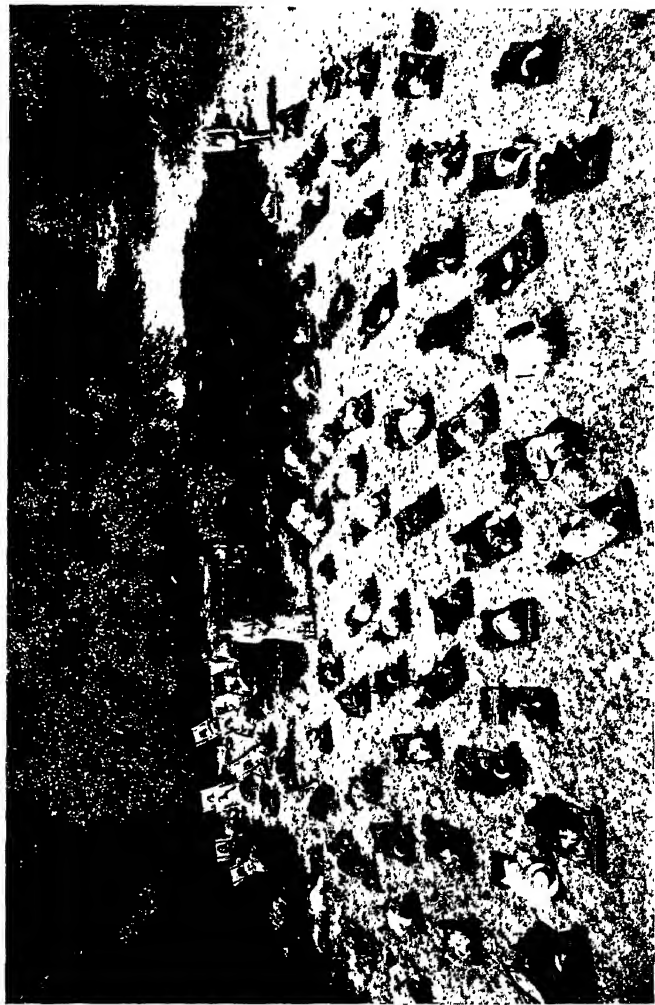
The average increase in weight was six

and a half pounds per child for the entire period, which is equal to a gain of one-half a pound per week per child. This gain was most noticeable during the latter part of the time. During the last four weeks the children averaged a gain of one pound each week per child. The greatest increase was nearly fourteen pounds.

The children not only profited by their school work, but they loved their school. Although the opening hour was nine A.M., many of those who lived within walking distance arrived as early as seven o'clock, and stayed as late as they were allowed to.

In 1908 the Bostall Wood site was given up, and this school transferred to a much better site on Shooters Hill, Woolwich. The government grant was increased from \$2,000 to \$10,000. Two new schools were opened, one at Horniman Park, and the other at Kentish Town. Each school provided for seventy-five children in three classes. The staff in each case consisted of a head teacher, three assistants, nurse, cook, helper, and school-keeper.

Dr. Frederick Rose, adviser of the Lon-



The rest hour during pleasant weather at Kentish Town



Portable buildings constitute the plant at Shrewsbury House

don County Council and one of the most active advocates of open-air schools, has gathered data from which he estimates that there are between thirty-five and forty thousand children in London in such poor physical condition that they cannot attend ordinary school without injury, but who may greatly profit from being sent to open-air schools.

The example set by London was followed in 1908 by Halifax and Bradford. In both of these cities open-air schools were opened in untenanted estates, where the mansions and outbuildings were utilized for school purposes. The Halifax school reports that the gain of the children in weight was from one to eight pounds, the average being three and a half pounds. Marked improvement was also noted in behaviour and studies.

The Bradford school was opened on August 31, 1908, and remained open for nine weeks, closing for the season on October 30th. A very good account of the work of the school and its results is contained in a special report published by the Education Committee of Bradford in 1908.

The situation chosen was almost ideal. The school was situated in a five-acre field almost five hundred feet above sea-level. The school was backed by an extensive wood which spread itself around three sides of the site. The school building consisted of two classrooms facing the south-east and opening on to a veranda in such a way that the veranda and the classrooms were practically one.

The children were thirty-nine in number. Most of them were described as "very poorly developed," "delicate," "neglected-looking," "anæmic," and "scrofulous." The seriousness of their physical defectiveness and generally debilitated condition is shown by the following table, which gives the physical defects found when the children were examined:

Phthisis (consumption of lungs)	present in	2
Tuberculous peritonitis	" "	1
Tuberculous scars on neck	" "	2
Bronchitis	" "	1
Adenoids	" "	7
Otorrhœa (ear discharge)	" "	2

Rickets	present in	5
Anæmia	“ “	18
Enlarged submaxillary glands	“ “	28
Eczema	“ “	2
Blepharitis	“ “	2
Keratitis	“ “	1

The children gathered each morning in the centre of the city and left at half-past eight for the school, arriving shortly after nine. They returned home each evening at six-thirty. The following time-table shows the general programme for the day:

9 A.M. . . .	Breakfast
9:45 to 10:45.	Ordinary school work
10:45 to 11 .	Play
11 to 12 . .	Ordinary school work
12:30 . . .	Dinner
1 to 2 P.M. .	Rest
2 to 3 . . .	Play
3 to 4:30 . .	School work, outdoor lessons, <i>e.g.</i> , nature study, geography
5.00	Tea
5:30 to 6 . .	Play

Three meals a day were given, as the physician in charge did not approve of the

practice common in the open-air schools of Germany of supplying food more frequently. For breakfast the children had porridge, milk, bread and butter. The dinners varied from day to day. In general the plan was to give soup, meat, vegetables, and pudding. The evening meal consisted of milk and bread with butter or jam.

As will be seen from the programme, an hour was given each day for absolute rest of all the children. For this purpose steamer chairs were provided and were so constructed that the children were able to lie in a much more recumbent position than is possible in most steamer chairs.

Each child was bathed weekly, and it was considered that baths constituted a very important part of the treatment of the children.

School work was carried on in the open air and gave very satisfactory results.

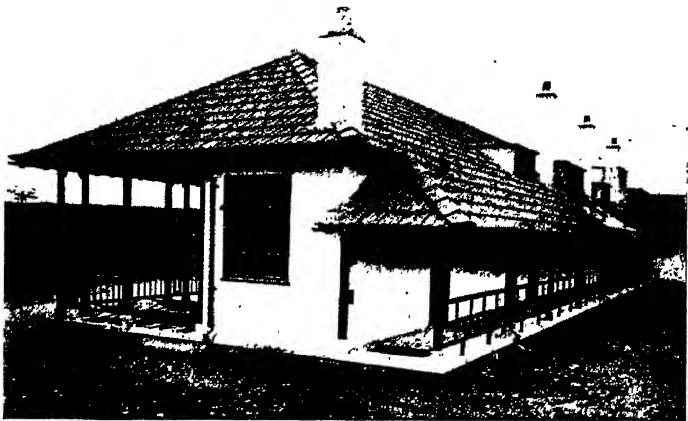
The children gained weight in a very satisfactory manner. At the end of the first month the average gain was two and a half pounds, or approximately as much as the children would have gained in six months under ordinary conditions.



Open-air classroom, Bradford, England



The afternoon rest at Bostall Wood, England



Main building, Bradford, showing covered way and porch classroom. The construction of the entire plant is notably solid and appropriate



General view of Thackley Open-air School,
Bradford, England

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**OPEN-AIR SCHOOLS IN THE
UNITED STATES**

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CHAPTER IV

OPEN-AIR SCHOOLS IN THE UNITED STATES

FROM the inception of the open-air-school movement in America, it has been everywhere intimately connected with the work and propaganda of the various anti-tuberculosis organizations. For this reason, detailed information about the various schools is mostly to be found in the publications of these associations rather than in the official publications of the boards of education.

This is illustrated by the fact that the following descriptions of the Providence and Boston schools are largely taken from a booklet entitled "Outdoor Schools," issued in 1909 by the Boston Association for the Relief and Control of Tuberculosis, and that much of the information on the Chicago school is taken from a pamphlet entitled "Chicago's First Open-Air School,"

also issued in 1909 by the Chicago Tuberculosis Institute. In the cases of all of these cities, mention of the work of the new schools has been made in the official reports of the educational authorities, but these reports have been much briefer and less detailed than those issued by the anti-tuberculosis forces.

PROVIDENCE, RHODE ISLAND

The credit and honour of establishing the first open-air school in the United States belong to the city of Providence, Rhode Island, where the work was begun on January 27, 1908. The location was a brick schoolhouse centrally located in the city and not then occupied. A room on the second floor was remodelled by the removal of part of the southerly wall, thus practically converting the four-sided schoolroom into one of three sides, leaving the fourth side open. For the brick wall thus removed, windows were substituted. These windows extend from near the floor to the ceiling, with hinges

at the top and with pulleys arranged so that the lower ends can be raised to the ceiling.

The desks of the children are placed in front of the open windows, the pupils facing the teacher, whose desk is in the opposite corner of the room. The children thus receive the fresh air at their backs, and get the light over their shoulders. The movable desks of the children occupy half of the room.

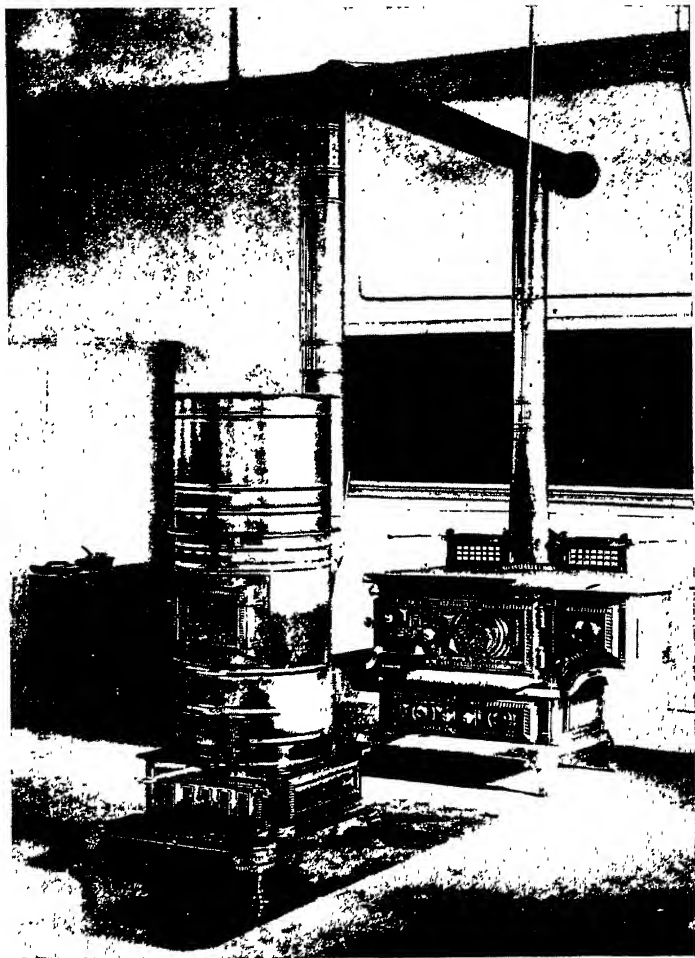
In the other half of the room there are two stoves — a large, old-fashioned cylinder stove for heating purposes, and a modern kitchen range for cooking. If the day is cold enough, the children upon their arrival go to the side of the room and get their blanket bags in which they sit at their desks. By putting their feet and legs in these bags and keeping on their outdoor clothing, they are comfortable even in the coldest weather. When necessary, they have in addition soapstone foot-warmers. The heat from the big stove tempers the air so that the temperature rarely falls to the freezing point. Besides the sitting-out bags the children



Letting the sunshine in. Exterior, Providence



Letting the sunshine in. Interior, Providence



The heating and cooking plant in the Providence school

Fifteen cases had reacted positively to the tuberculin test. No open cases were accepted, nor any cases running a constant temperature above normal.

The children arrive at the school at nine o'clock in the morning, and have a recess at ten-thirty, when they are given hot soup. At twelve o'clock they all take seats around tables and eat lunch. This consists of a hot pudding, such as tapioca or rice, served with cream, and hot chocolate or cocoa made entirely with milk. In addition, many of the children bring potatoes or bits of steak or chops, which are also cooked and added to the lunch. The cooking is all done by the teacher.

Before eating, each child must thoroughly scrub his hands, wash his face, comb his hair, and after eating clean his teeth. Each child is taught the necessity of having an individual drinking-cup and tooth-brush.

Details of the children wash the dishes each week and take turns in setting the table and in serving. Those who are not thus engaged go out into the yard and play until the school reassembles at one o'clock.

At two-thirty o'clock school is dismissed for the day. Pupils who have come from a distance are provided with car tickets through the League for the Suppression of Tuberculosis. Some receive tickets for travelling both ways, and some for one way only, depending upon the need and strength of the child.

During the school day some light gymnastic exercises are given, including wand drills, and the children are taught proper methods of breathing.

In the spring the children have a garden in which they themselves work under the supervision of a man employed for this purpose in connection with the other public schools.

The Providence open-air school is a part of the general school department of the city. It is located in a public-school building and the school supplies are furnished and the salary of the teacher paid by the School Committee. The League for the Suppression of Tuberculosis defrays the expense for food and the carfares. The children are under the constant observation of a

woman doctor who is active in the work of the League, and is also one of the regular medical inspectors of the city schools.

The school has been a thorough success from the start. Almost without exception the children have benefited greatly from the open-air treatment. The report of the first entire school year stated that all of the children except one showed marked improvement. There was an average gain in weight of five pounds, the highest gain being fourteen pounds by a girl ten years of age, and the smallest gain for a pupil attending the whole year, being three pounds. Moreover, there were gains in alertness, truthfulness, etc., that cannot be measured by figures. A number of the children, as their physical condition improved, have returned to the regular schools, and have been well up in their school work instead of being backward, as they would have been had they remained in the regular schools.

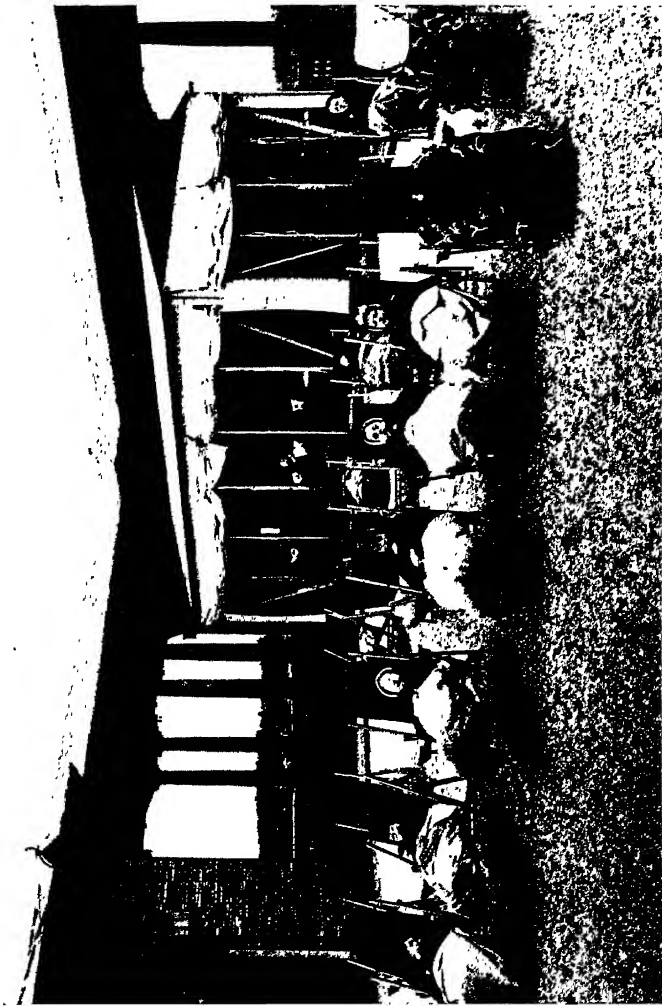
BOSTON

On the sixteenth of July, 1908, the Boston Association for the Relief and Control of

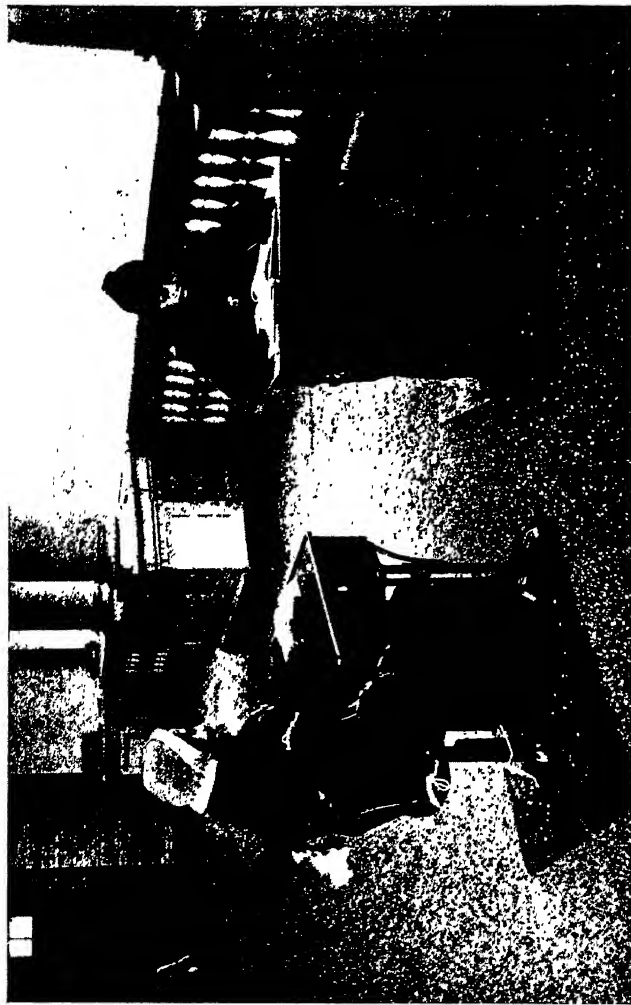
Tuberculosis opened a school of outdoor life at Parker Hill, Roxbury. The equipment consisted of a lean-to used as a kitchen, toilet rooms with shower baths, and a large tent used as a dining room and as a shelter in stormy weather. Three meals a day were served. The children spent their time caring for their vegetable and flower gardens, assisting with the housework, resting, and playing. No formal instruction was attempted. It was simply a day camp for tuberculous children.

The results were so satisfactory that the Association decided to ask the Boston School Committee to coöperate with them and establish an outdoor school. This was readily agreed to, and the Public School Committee supplied the teacher, desks, books, etc., while the Association undertook to supply the necessary clothes, food, nurse, attendants, home instruction and care, and the medical service.

The school was held in the tent up to January 14, 1909. After that date it was transferred to Franklin Park. The location was a large building originally erected



Franklin Park School and pupils, Boston



Individual equipment in Boston includes heavy outer clothing, sitting-out bag, portable desk and chair

for a refectory. Upon the roof of this building the city and the Association erected an outdoor schoolroom. In the room there were twenty adjustable desks, and seats besides the teacher's desk. The building was thirty feet long, twenty feet wide, and fifteen feet high. The roof was covered with rubberoid, and on the four sides were canvas curtains, which could be lowered in stormy weather.

Inside of the building there were a kitchen and dining room, toilet rooms, rest rooms, and an emergency schoolroom.

The children were provided with reclining chairs and blankets, overshoes, overcoats, sitting-out bags, and individual cups and tooth-brushes. All of these articles were numbered and remained the property of the children while they were in the school. If the children's outer clothing became damp on the way to school it was replaced during school hours by those belonging to the school.

The children arrived at eight-thirty and had breakfast. Lessons began immediately afterward. Details of the children cleared

the tables, washed and dried the dishes. The time between breakfast and dinner was devoted to regular grade work divided into twenty-minute periods. Dinner was served at twelve-thirty, and the children helped to set the table and serve the food. After dinner there was a rest period for one hour, and school work was then resumed. At four-thirty a light supper was served, and at five the children returned home.

Cleanliness was insisted upon, and the children were required to wash their hands and faces before each meal and brush their teeth afterward.

The children were weighed and had their temperatures taken every day. The Association nurse took them to the dental clinic to have their teeth put in order, to the eye and ear infirmary to get glasses for those who needed them, to other hospitals as needed, and made provision in settlement houses or public baths for bathing at least once a week.

The school was kept open on Saturdays and during the holidays under the supervision of a kindergarten teacher supplied by the Association.



Refreshments outdoors, Boston



Needlework under the trees, Boston

All of the children in the Boston school had originally shown physical signs of weakness in the lungs, but no distinct or marked open cases were admitted.

The children who were able to do so brought ten cents each day to help defray the cost of the food. In the cases where the family was too poor to do this the money was supplied by some charity.

While the combined public and private support had in the main proved thoroughly satisfactory, it seemed best for many reasons to reorganize the school so that it would be entirely under municipal authority. This has accordingly been done, and at the present time the school is maintained by the Consumptives' Hospital Department of the city and the School Committee together. The Hospital Department furnishes transportation, food, etc., while the School Committee elects the teachers, pays their salaries, and furnishes school supplies, books, desks, etc.

The children are selected by the school nurses. Each child is examined at the out-patients' department of the Boston

Consumptives' Hospital, and is admitted to the school only upon the evidence of tuberculosis.

Since its reorganization the school has been enlarged and at present (June, 1910) there are some 110 children enrolled and five teachers are employed. The school is no longer an experiment; it is a demonstrated success.

The school in Franklin Park has proved so successful and attracted so much favourable comment that the Boston School Committee requested its special advisory committee on school hygiene to report on the advisability of establishing open-air rooms generally, the type of such rooms and proper number of children for whom they would be desirable. It was requested that the following points be covered:

1. The method of selecting children needing to be placed in such rooms.
2. The symptoms of such need that should be especially called to the attention of the teaching force.
3. The sort of rooms that should be used for this purpose.

4. Whether or not the windows of such rooms should be open all the time, and, if not, what exceptions should be made.

5. What special clothing, if any, should be provided for children placed in these rooms.

6. Whether or not there are teachers whose physical condition would be benefited by assignment to such rooms.

7. Whether or not it would be desirable to have teachers and school nurses make special inquiry into the home conditions of children needing such treatment.

The advisory committee reported that such "health-rooms" should not be confused with present provisions for the mentally deficient or the tuberculous (by no means generally established) and that a sharp distinction should be maintained between them. It felt that the "health-rooms" should be limited to those physically debilitated. Its recommendations, in brief, were as follows:

The advisory committee is unanimously of the opinion that it is desirable to establish open-air rooms in school buildings for those

children who are physically below normal in development.

That in the establishment of such open-air rooms, sunlight, preferably direct sunshine, as well as fresh open air, is necessary.

That in the assignment of children to these special rooms, the medical inspectors, the school nurses, and the teachers should select those who are anæmic, who are undersized and below the normal weight for their height, those showing evidence of glandular enlargement, and those who return to school after a long convalescence from illness.

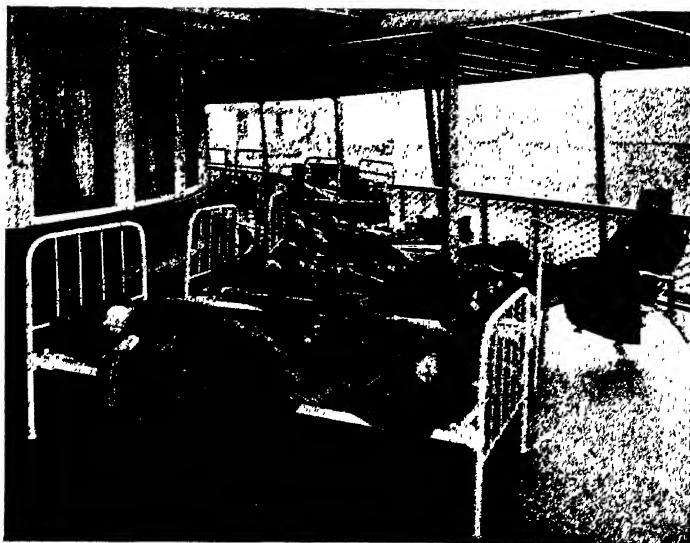
In this connection the advisory committee wishes to emphasize the great value of weighing and measuring the school children, as this will furnish one of the most trustworthy guides to the selection of those who are physically below normal.

That in the present school buildings, at least in the overcrowded sections of the city, rooms suitable for the purpose of these classes should be located in the upper stories of the building with a southern exposure, in order to furnish the necessary maximum of sunlight without which any room of this type must be uncomfortable, cheerless, and lacking in a most essential quality.

In buildings where the roof offers an



The ferry-boat *Southfield* utilized for an open-air school in New York City



The rest hour on the *Southfield*, New York City



A class on the deck of the *Southfield* in January, New York City

opportunity for outdoor use, shacks and other provisions should be established to carry out the purpose of these recommendations. The committee does not enter here into the details of this utilization of the roofs of school buildings, because it understands that a report dealing in a special manner with this phase of the problem is to form a separate communication from the advisory committee to the school committee at an early date.

The committee strongly recommends that in all future school buildings a room especially adapted for the purpose herein outlined shall be included in the plans and accepted by the school committee. Further details on this recommendation are also to form a part of the committee's special report.

In special rooms designated as health-rooms to be established in buildings now in use, arrangements should be made for the widest use of open windows, in order that the maximum amount of fresh air may find access to every part of such rooms.

That suitable protection for the feet and legs is necessary in all open-air schoolrooms. A sort of sleeping-bag, so called, is the most practical.

The committee believes that there are

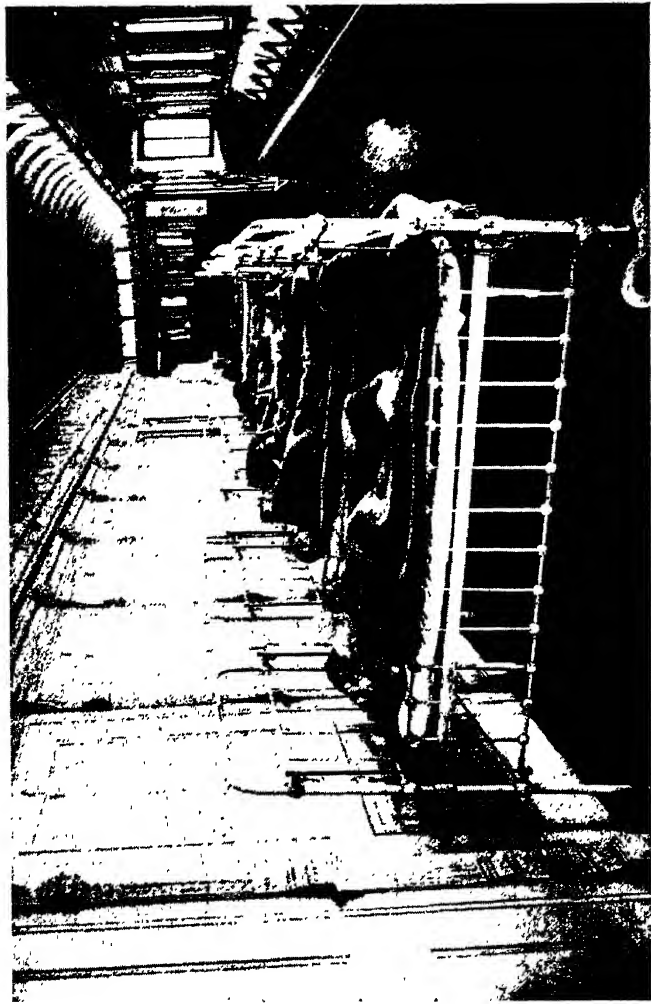
undoubtedly teachers whose physical condition would be benefited by assignment to such rooms.

That in the carrying out of the health measures herein outlined, the services of the school nurses are most valuable and would increase greatly in the homes the efficiency of the work undertaken in the schoolrooms for the health of the children.

It will be noted that these open-air rooms are not to be for tuberculous children, but rather for those suffering from anæmia and malnutrition and those who are convalescing from recent illnesses. The candidates for these classes are selected by the room teachers and nurses and submitted to the medical inspector for final decision. There are in the public schools of Boston 90,000 children. The first selection of pupils for the open-air classes took place in the early part of the school year 1909-10 when 5,043 children, or about $5\frac{1}{2}$ per cent. of the entire membership, were chosen by the teachers and nurses as requiring open-air treatment. When these children were re-examined by the school physicians the



Washing up for dinner on the *Southfield*, New York City



Rest hour in the cabin of the *Southfield*, during very stormy weather, New York City

decision was indorsed in the cases of 4,489 of them, or almost 5 per cent. of the entire membership.

These figures are especially interesting, for they are unique. They seem to indicate that in large cities about five per cent. of the school children are in such debilitated condition physically as to need such treatment as that afforded by special schools of the open-air type.

NEW YORK CITY

The first open-air school to be established in New York City under the auspices of the Department of Education was started in the outdoor camp for tuberculous patients maintained by Bellevue Hospital on the ferry-boat *Southfield*. There were among the patients a large number of children who were receiving open-air treatment on the ferry-boat. These children one day banded together and informed the doctor that they wanted to have a teacher and attend school.

When this action was reported to the Board of Education, it was felt that so un-

usual a plea should be given a prompt and favourable response, and in December, 1908, the school on the ferry-boat was officially made an annex of Public School Number 14.

Except for its unusual location the school on the ferry-boat does not differ greatly from the other open-air schools which have been described. The teacher is paid and the school supplies are furnished by the Board of Education. The children are fed and necessary clothing is provided by the hospital authorities. The school is, of necessity, an ungraded one, and the number of children taught by one teacher is kept in the neighbourhood of thirty.

So successful has the school on the *Southfield* proved that four more open-air schools have been established — three on the ferry-boats *Westfield*, *Middletown*, and *Susquehanna*, and one on the roof of the Vanderbilt Clinic, at Sixtieth Street. Officially, these open-air schools are all considered to be annexes of regular public schools in the vicinity.

On October 29, 1909, the Board of Es-

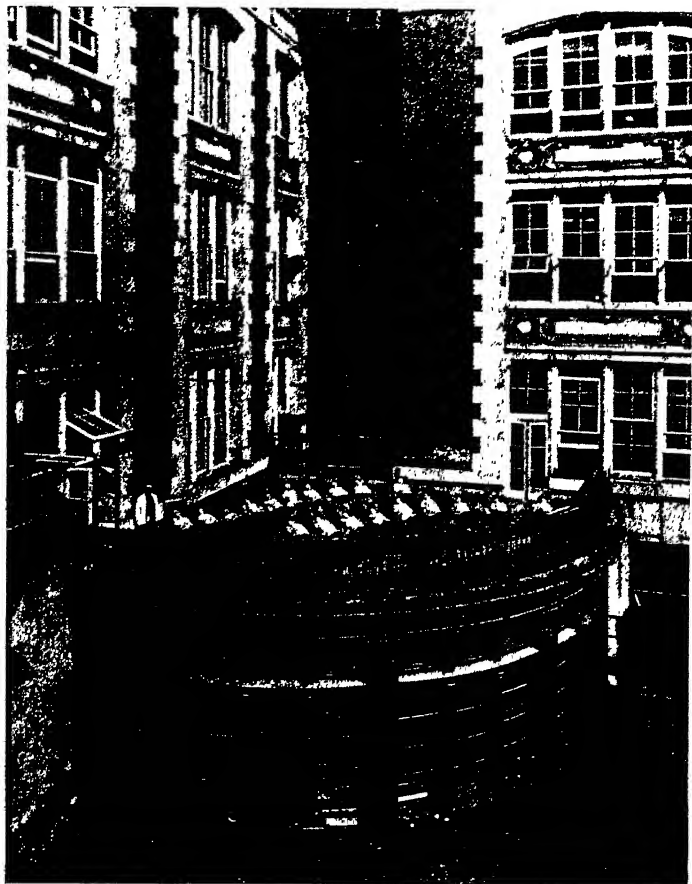
timate and Apportionment granted the sum of \$6,500 to the Board of Education for the purpose of remodelling rooms in some of the school buildings for use by open-air classes. On December 22, 1909, Dr. William H. Maxwell, Superintendent of Schools, called a conference of medical and school authorities to decide how the rooms should be remodelled to fit them for their new use, what furniture and equipment should be supplied, and how children for the new classes should be chosen.

As a result of this conference it was decided that the maximum number of children who should be admitted to any one open-air class should be limited to twenty-five. The children are to be chosen by the director of the tuberculosis clinic nearest the school and by the school principal. No child is to be assigned to the open-air class until the permission of the parents has been secured in writing. Children are to be discharged from open-air classes by the admitting physician on the recommendation of the principal. Children moving from one district to another are to be fol-

lowed up and taken care of in the new district. No rule was adopted defining the exact physical condition in which a child must be in order to be considered a proper subject for open-air treatment. It was decided that each case shall be considered separately, and that the only definite rule to be observed is that no open cases of tuberculosis shall be received in these classes.

It was agreed at the conference that the intakes of the regular ventilation system shall be cut off, and hand control of temperature prevail, and that, further, the minimum temperature allowed in the room shall be 50 degrees Fahrenheit. Every room is to be provided with twenty movable and adjustable desks and chairs, and the same number of regular chairs, and the windows are to be provided with Venetian blinds. The rooms used for open-air classes are, whenever possible, to be located on the third floor of the building, in order that they may be above the dust level of the street.

In these open-air rooms the teachers, school supplies, clothing, robes, caps, foot-



April, 1910, New York established its first open-air class in a public school building at P. S. 21, Manhattan. Outdoor classes are held on the sheltered roof, while the open windows of the classroom may be seen on the left



The classroom tent of the first Chicago school



Tent interior, Chicago

warmers, scales, and other equipment are to be provided by the Board of Education, while the food is to be supplied by the Committee on the Prevention of Tuberculosis of the Charity Organization Society.

The first of these open-air classes was established in April, 1910, in School Number 21, at Mott and Elizabeth Streets. The organization of these open-air classes has awakened great popular interest in New York City, and it is probably a direct result of this interest that in April, 1910, Park Commissioner Stover announced that he had decided to grant special privileges which would permit children of the kindergarten classes of the public schools to pursue their studies in the open air during the pleasant weather in Central Park and the other parks of Manhattan.

CHICAGO

Chicago's first outdoor school for tuberculous children was made possible through the joint coöperation of the Board of Education and the Chicago Tuberculosis

Institute. The school was opened during the first week of August, 1909, on the grounds of one of the public schools. The buildings, equipment and teaching staff were furnished by the Board of Education, while the selection of the children, food supply, cook, nurse, and medical service were assumed by the Tuberculosis Institute. A large shelter tent and thirty reclining chairs were secured for outdoor use, and a range, cooking utensils, table-ware, kitchen and dining-room tables, and icebox were installed in the basement of the school building. The principal and two teachers were supplied by the Board of Education.

The Tuberculosis Institute placed one of its nurses on half-time attendance at the school to watch the temperature, weight, pulses, and general condition of the pupils. Of the thirty children chosen for the experiment, seventeen had pulmonary tuberculosis in its first stages, two had tuberculous glands, and eleven were pronounced pre-tuberculous. None had passed to the "open" infection stage, but two-thirds of them showed a temperature range from



Open-air exercise, Chicago. The rest period is also taken here



Hartford class with appropriate but inexpensive equipment

99 to 100.2 on admittance. The school was open for one month, and during that time the daily programme was similar to those already described in the cases of outdoor schools in other cities. The children received plenty of fresh air, good food, rest, and common-sense school work.

The results of this short experiment were thoroughly satisfactory. The children made marked gain in weight, and practically all showed normal temperature. The general condition was greatly improved.

The experiment attracted a great deal of attention and discussion in the city, and there were many who thought that while it was all very well as a warm-weather enterprise it could never be conducted during the colder months. It seemed to those who had the interests of the new school at heart that it was very desirable to convince these doubters that open-air schools could be successfully conducted all the year round. This was made possible by a grant made by the trustees of the Elizabeth McCormick Memorial Fund to the United Charities.

Again in coöperation with the Board of

Education the new school was started in the fall of 1909 on the roof of the Mary Crane Nursery Building. This measures about 40 by 70 feet. A portion of this place measuring about 30 by 50 feet has been enclosed by a fence made of wire netting, and in the enclosure there has been erected a sort of permanent tent made of asbestos board so that it is fireproof and can withstand wind and storm. The windows about the sides lift, so that there is an open zone around the tent. In fair weather the children take their rest hour in the open. Meals are served in the dining room two floors below, and the daily bath is taken in bathrooms in the building proper.

This was probably the only school in the city of Chicago where the boys and girls refused to take a vacation during the last Christmas holidays. It is reported that they all came back asking that the school go on during the vacation time, and their request was granted.

In Chicago the experiment of the open-air school has resulted in the development of still another type of education in the open



A classroom is used as a dining-room at Rochester



Handwork is a prominent feature in the Rochester school



The rest hour at Rochester

air. The principal who had charge of the open-air school which was maintained during the summer of 1909 continued experimenting in his own building after the regular school year opened. Beginning in the early fall he regularly left the windows of two schoolrooms wide open and continued the work with a much lower temperature than that commonly maintained in schoolhouses. These open-air schoolrooms are not designed for tuberculous children or for any other class. The experiment was based on the feeling that what is good for the debilitated and unsuccessful might reasonably be supposed to benefit bright and normal pupils. When necessary, the children in these fresh-air rooms retain their outdoor wraps. The temperature is not allowed to drop to the freezing point, but it is kept much lower than that of the other rooms. The regular school seats and desks have been replaced by chairs and tables, and the children are encouraged to take much more exercise in the shape of play than is permitted by the traditional school régime.

So far the results of this experiment have been encouraging. A physical examination of the pupils was held after eight weeks of fresh-air instruction. The test was made on the proposition that the child with a stopped or running nose is handicapped in his efforts to learn. Among the ninety pupils in the two rooms two were found with running noses. In the next two rooms warmed in the usual manner, there were found forty cases of nasal discharge. The evidence in favour of the open-air treatment could scarcely be more striking.

HARTFORD, CONNECTICUT

In the summer of 1909 the Hartford Society for the Prevention of Tuberculosis established a camp and an outdoor school in one of the city parks. Forty-one children were admitted during the summer. They were mostly frail and anæmic and weighed on the average eleven pounds below the normal weight for their age. The children who remained in the camp nine weeks or over gained on the average six pounds

during that time, while a marked improvement was shown in the condition of those who remained for a shorter period.

In view of the favourable results obtained, the city granted an appropriation to support the work, and in the first week of January, 1910, the open-air school held its first session in a tent near a leased building used for evening and vacation schools. The school is supported by the city school department and the Society for the Prevention of Tuberculosis in coöperation. The city pays for instruction and equipment, and the Society provides warm clothing and the necessary meals.

The school has an inexpensive and excellent plant. It has a house for indoor sleeping in case of too severe weather, and a large army tent with desks on its board floor as its schoolroom. The enrolment is between thirty and forty, and there is a head teacher and an assistant teacher.

In the first ten weeks the school accomplished some splendid results. The average gain in weight was five pounds. The gain in disposition toward study and play was

notable and the children easily kept up with their regular school classes.

OTHER CITIES

At least one more open-air school has been established by a department of education. This school was opened in the city of Rochester, New York, in October, 1909. There is so far little available information concerning this school.

There is at least one open-air school being supported entirely from private funds. This is located in Pittsburgh and it was started in February, 1909, by the Civic Club of that city. The school is located on one of the porches of the Pittsburgh Sanatorium.

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RESULTS

CHAPTER V

RESULTS

FROM a physical point of view, the testimony as to the results of open-air schools is all on one side. From Germany, England and America come unqualified endorsements with scarcely a dissenting note.

The report of the work in the Charlottenburg school tells us that the physical results were decidedly satisfactory. This is proved, first, by the improved general appearance of the children, and, secondly, by the results of individual physical examinations. After a few weeks a great improvement in the general condition of the children was manifested with regard to appetite, attention, general temperament and appearance. The final medical examination at

the end of three months gave the following results:

	Aggravated	Unchanged	Improved	Cured
Anæmia	1	9	11	13
(34 children)				
Scrofulous diseases —	—	8	22	8
(38 children)				
Heart diseases —	—	7	7	—
(14 children)				
Pulmonary diseases 1	1	8	8	4
(21 children) —	—	—	—	—
Total (107 children)	2	32	48	25

The table shows that among one hundred seven cases the results of the school was a decided improvement or complete cure in seventy-three cases.

To these favourable results must be added the increase in weight shown by the children. On the average this was between six and seven pounds a child, or, roughly, about one-half a pound per week. Many children increased by eight pounds, and eleven of them showed increases of between eleven and eighteen pounds.

It was also shown that the children's powers of resistance had been greatly

enhanced by their life in the open air, so that, although the month of October was exceptionally cold and wet, none of the children suffered from colds or similar indispositions. From a medical point of view these favourable results have been attained by the simplest means; namely, being constantly in the open air, the action of sunlight, baths, simple but regular food, and school instruction diminished both in the number of hours and in the number of pupils to a teacher.

The testimony from the other German schools is similar to that from Charlottenburg. The results of the Mülhausen experiment have been very satisfactory. The children have increased in weight and improved in strength, energy, and mental alertness.

The first reports from München-Gladbach cover only the short period of two months, but even this short session worked wonders with the children as regards increase in weight, improved appearance, and bodily and mental activity.

It has already been stated that in

establishing the school at Bostall Wood the London County Council had in view two objects: first, to benefit the children physically, and, secondly, to prevent educational loss while they were undergoing special treatment. It is beyond question that the school attained both of these objects. Physical improvement was shown by their greater muscular ability and enhanced physical and mental endurance.

During the thirteen weeks that the school was in session the children gained on the average six and a half pounds apiece in weight. As in the case of the Charlottenburg work this is equal to half a pound per week per child. The greatest increase was nearly fourteen pounds. In the case of the London children the increase was greatest during the latter part of the time, averaging during the last four weeks nearly one pound per week per child. It is noteworthy that both in the Bostall Wood school and the one at Charlottenburg the increase in weight amounted on the average to one half a pound per child each week, although in the case of Charlottenburg the children

received five meals a day and did much less work and walking than did the London children.

How the children improved in weight is impressively shown in the case of some of the individuals. For example, Kathleen M —, aged eleven, was a very anæmic child. When she was admitted to the school during the second week she weighed a little less than sixty-eight and a half pounds. She gained weight steadily and rapidly until the seventh week, when she weighed seventy-seven pounds. During the eighth week she was absent and lost nearly a pound in weight. Upon returning to school she immediately began to regain the lost ground, and when weighed again at the end of the tenth week had attained a weight of nearly eighty pounds. The history of the case is shown in the diagram in which the heavy line shows the increase in weight from week to week. The falling off caused by the absence during the eighth week is noticeable. It would be hard to get more convincing evidence of the value of the outdoor schools.

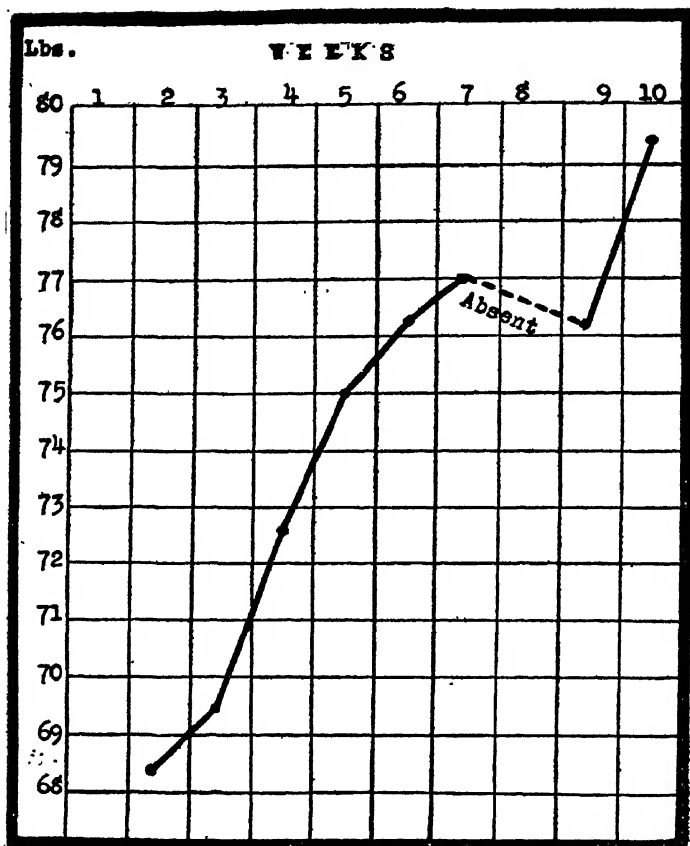


Chart I. Variations in weight of Kathleen M.—, Bostall Wood Open-air School. Note decrease during eighth week when she was absent.

The case of Kathleen M— was by no means exceptional. Many of the other children showed similar histories. A similar

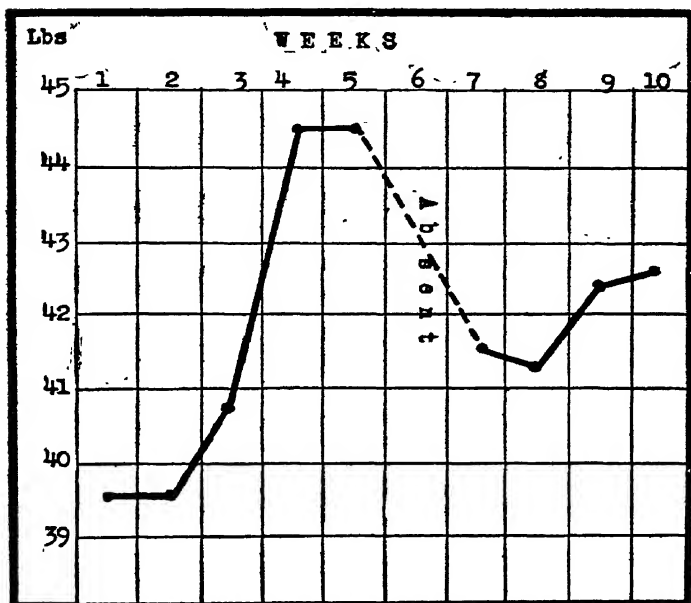


Chart II. Variations in weight of Arthur W—, Bostall Wood Open-air School. Note decrease during sixth week when he was absent.

chart shows how Arthur W— increased rapidly in weight from the first to the fifth week, lost severely during the sixth week,

when he was absent, and upon returning to school regained much of the lost ground.

Convincing evidence as to the effect of the school life on nutrition is furnished by the results of the hæmoglobin test. The red colour of the blood is due to the presence in the red blood corpuscles of a chemical substance known as hæmoglobin. This substance plays an important part in carrying the oxygen from the air in the lungs to all the tissues of the body, and the proportion in which it is present in the blood is a valuable indicator of the degree of anæmia present and the condition of the child's health.

The improvement produced in this respect is most interesting. The hæmoglobin test showed the percentage among the boys on admission was 74.8, the normal percentage being 100. Five weeks later the percentage among the same boys was 80.1, an increase of 5.3. The percentage among the girls upon admission was 75.6. Five weeks later it was 81.2, an increase of 5.6.

Results in the Thackley open-air school

maintained by the city of Bradford for nine weeks during the fall of 1908 are fully as convincing and consistent as those already discussed. The report of the school speaks in glowing terms of the improvement of the children in appearance, expression, and alertness.

A summary of the results with respect to increase in weight, hæmoglobin percentage, and chest measurement offers convincing testimony of the value of the work:

BOYS

Number	19
Ages	7 to 11 years
Average age	8.7 years
Average weight on admission	43.25 lbs.
Average weight nine weeks later	46.25 lbs.
Average increase	3 lbs.
Average hæmoglobin percentage on admission	78
Average hæmoglobin percentage nine weeks later	88
Average increase in hæmoglobin percentage	10

Average chest measurement at full inspiration on ad- mission	23.3 inches
Average chest measurement at full inspiration nine weeks later	24.3 inches
Average increase in chest measurement	1 inch

GIRLS

Number	21
Ages	7 to 12 years
Average age	8.5 years
Average weight on admis- sion	44.5 lbs.
Average weight nine weeks later	50.2 lbs.
Average increase	5.7 lbs.
Average hæmoglobin per- centage on admission . . .	80
Average hæmoglobin per- centage nine weeks later .	90
Average increase in hæmo- globin percentage . . .	10
Average chest measurement at full inspiration on ad- mission	23 inches
Average chest measurement at full inspiration nine weeks later	24 inches

Average increase in chest
measurement 1 inch

In general the children gained weight very rapidly during the first four weeks and then somewhat less rapidly during the succeeding five weeks. The school was closed on the thirtieth of October. The records of the children showed that in the next two weeks they fell off sharply in weight and then started slowly to gain again. The whole story is shown graphically in the following chart in which the average weekly gain is shown by the heavy black line. It will be noted that it rises steadily and rapidly during the month of September, continues to rise, but more slowly, during October, and then falls off sharply after the school is closed.

The heavy dotted line indicates roughly the approximate average increase which takes place in the schools of Bradford in the case of similar children under ordinary conditions. The notable feature is, of course, how much more rapid the gain is under the healthful conditions imposed by the outdoor school.

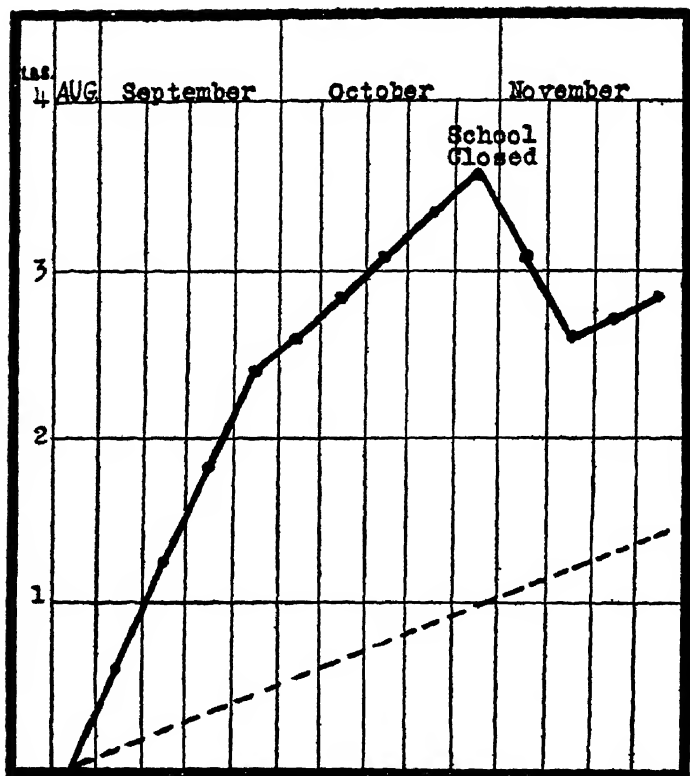


Chart III. Showing the average weekly gain or loss in weight of children attending the Bradford Open-air School in 1908. The dotted line shows the average increase which takes place in the case of children under ordinary conditions.

Turning now to America we find it much more difficult to secure definite accounts in quantitative terms of the results of the outdoor school work. In general the records in our schools have not been so carefully kept, nor are they so full in scope, as the foreign ones.

In Chicago the first outdoor school was opened for tuberculous children on August 3, 1909, and was kept open for one month. There were thirty children in attendance, seventeen of whom were above normal age for the grades they were in. The results of this short experiment were as follows:

The total gain in weight for the thirty children was one hundred thirteen and a half pounds, the range being from one to seven pounds.

When the children were admitted to the school twenty of them showed a temperature ranging from 99 to 100.2 degrees. On discharge only two showed temperatures above 99 degrees, while all the rest were practically normal.

The general condition of all was improved.

Principal William E. Watt of the Graham School has the following to say about the results of the cold-air-room experiment already described:

“The children are delighted to breathe pure air all day in school and out. They are not compelled to stay in the room, but there are many more clamouring to get in. It has been a most successful experiment. Pupils have been cured of catarrh, swollen glands have been reduced to normal size, and tubercular symptoms have disappeared. Their resistance to disease has been raised, and they are much more healthy.”

One most impressive set of definite data has been gathered from the record cards of the children in the Providence school. This school was opened in January, 1907, and individual records of the pupils have been kept continuously up to the present time. One portion of these records consists of the results of the hæmoglobin tests. How these have fluctuated for the entire class for a period of a year and a half is shown graphically in the following diagram:

The diagram shows that when the school opened in January the hæmoglobin percentage was a little less than 74. The

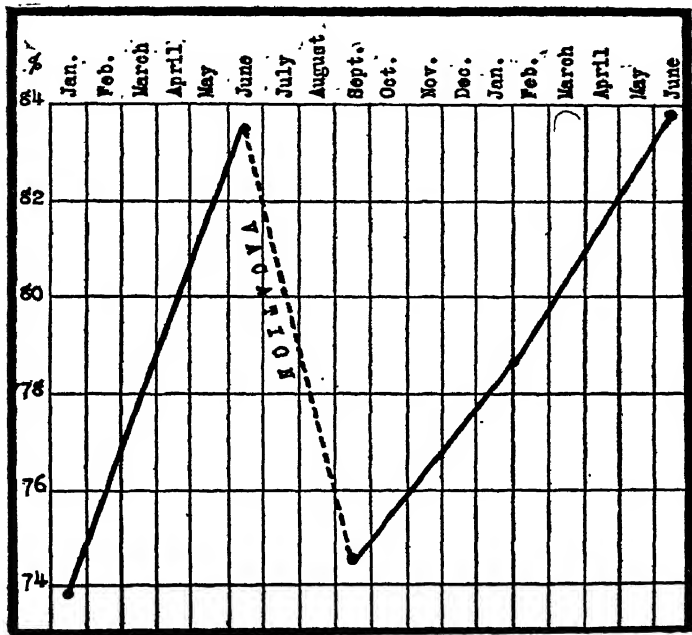


Chart IV. Hæmoglobin tests, Providence Open-air School, 1908-1909. Average for class. Note falling off during vacation.

solid line shows how this percentage rose steadily until it almost reached 84 at the close of the school year in June. Then the

children went to their homes for the long summer vacation, and the dotted line shows how their hæmoglobin percentage fell during that time until it almost reached the 74-per-cent. level again. When the open-air classes began again in September the hæmoglobin percentage began to rise, nearly reaching the 79-per-cent. level by the end of January and climbing almost to 84 per cent. by the close of the year in June.

These results are not entirely definite and trustworthy for the reason that they do not show conditions among exactly the same group of children during the entire period covered. Some of the original children dropped out during the first year, and their places were taken by other children who entered later, and whose records are included in the average results shown in the chart. Nevertheless, an examination of the individual records shows that in general the average results among the same individuals are similar to the results for the entire class as shown in the diagram. The record is consistent in its essential agreement with those already cited. Physical gains are

shown to be rapid and constant while the pupils are in attendance. Their losses when they are absent are immediate and marked, and upon returning their gains begin at once.

In an account of the Providence outdoor school by Walter H. Small, then Superintendent of Schools of that city, published in the *Journal of Outdoor Life* for March, 1909, the results are summed up in the following concluding paragraph:

“More visitors have called upon this school than any other in the city. Begun as an experiment, it has proved its worth and is not now experimental. Arranged for twenty pupils, it contains all grades, from the beginning to the highest elementary grade. Not all grades are present at once. The school enrolment is varying and the work is necessarily individual. Each does what he can; he is not urged; but he sits in the sun, keeps healthfully busy, drinks in fresh air, and grows stronger physically and more alert mentally. To see the colour come into the cheeks and the sparkle into the eye and to see the emaciated form fill out convinces those close to the work that it pays abundantly.”

In the school maintained for tuberculous children in Franklin Park in Boston the medical results were most satisfactory. Up to June 14, 1909, forty-one children had been at the school for one month or more. Twenty-three of them had had their tubercular processes arrested and had returned to the regular public schools, and in each case without loss in their school work. Of the twenty-three arrested cases all except two are known to be well now and present no physical signs in the lungs.

From an educational point of view the results have also been most satisfactory. The children became more alert mentally and showed considerable increase in attention to work. They improved in appearance, were neater and cleaner, had better manners and were more orderly, and their parents remarked these changes.

Another set of results from Boston comes from the Prescott School where an open-air class numbering about twenty was conducted during the spring months of 1907. This class was made up of thin, pale, and anaemic children of the fourth and fifth



Garden work was popular at Bostall Wood



Halifax, England. The children help in such tasks as cleaning cutlery



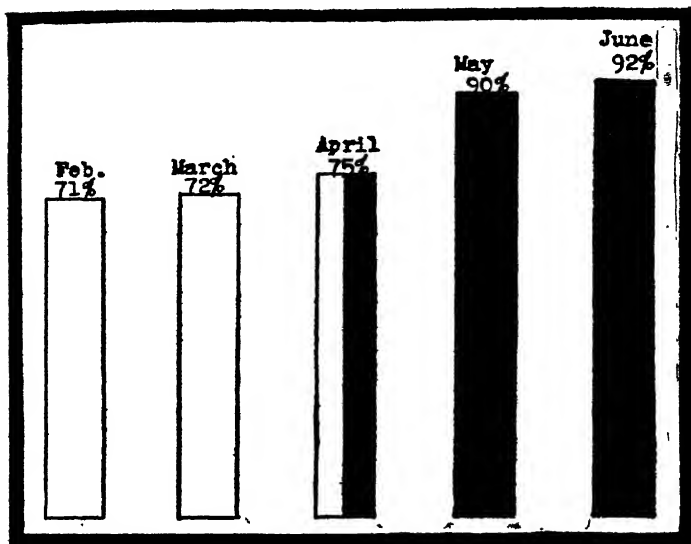
Working out trade routes between Europe and North America, Dulwich

grades who were members of overcrowded classes and had been repeatedly absent. These children were removed from the regular classrooms and given portable desks in a corner of the schoolyard.

They gained rapidly in weight, mental alertness, and physical condition. These gains are reflected by the improvement in attendance which was brought about as a result of the open-air régime. During the month of February the average per cent. of attendance among these children, then members of the regular indoor classes, was 71, and in March it was 72. During the month of April the children were removed from the regular classrooms to the open-air class, and the per cent. of attendance increased to 75. In the month of May it jumped to 90, and reached 92 per cent. in June. This marked improvement following the organization of the open-air class is graphically shown in the diagram.

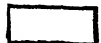
One of the most remarkable results of all of the open-air schools has been the demonstration of the fact that many of the ordinary classroom subjects can be

taught more efficiently in the open air. This is brought about through intelligently seizing the unique opportunities offered



Attendance in Prescott School, Boston, in 1907, of same class during two and a half months indoors and two and a half months outdoors.

Indoors



Outdoors

by the immediate environment of the school as working material for imparting knowledge. For example, in Charlottenburg in

teaching arithmetic the children are provided first of all with tape measures and are encouraged to use them as much as possible. They measure the ground and various objects, count the trees, calculate spaces, etc. Every effort is made to avoid the mere manipulation of figures and to bring the arithmetical instruction in touch with actual conditions and dimensions.

The teaching of geography greatly benefits by outdoor methods. Relief maps are constructed in sand, the configuration of the surrounding country explained, mountain ranges made to scale, and almost all geographical definitions suitably illustrated. The action of running water upon river-banks, the carriage of suspended mineral matter by rivers, the silting up of river-beds, the formation of deltas, the causes of floods, the means of irrigation, are brought home to the children's minds with the greatest ease.

The lives of plants, animals, and insects are shown almost from birth to death, and the children are trained to study and observe but not to destroy harmless animals and

insect life. The decomposition of rocks and the formation of soils are studied at first hand. In connection with nature study a large amount of weather observations and study of the heavens are also carried on.

The children are taught to look upon themselves as a large family and are trained to exercise all the virtues necessary for ordered life in the communities. It is impressed upon them that school buildings and grounds have been loaned to them for their benefit and that they must restore them in the same condition that they found them so other children may receive the same advantages.

FEEDING

CHAPTER VI

FEEDING

THOSE who have had in charge the organization and administration of open-air schools have almost without exception agreed that one of the most important factors in successful work of this type is wholesome and adequate feeding. As to just how this feeding shall be carried out there is considerable diversity of opinion and practice.

In Germany the best practice sanctions frequent feeding amounting almost to what is termed forced feeding. Five meals a day are regularly given.

The daily routine in Charlottenburg is as follows: The children arrive at about a quarter to eight and receive a bowl of soup and a slice of bread and butter. Classes commence at eight with an interval of five minutes after every half-hour's instruction.

At ten o'clock the children receive one or two glasses of milk and another slice of bread and butter. Dinner is served at half-past twelve and consists of about three ounces of meat with vegetables and soup. After dinner the children rest or sleep for two hours. At four o'clock milk, rye bread, and jam are given. The last meal consists of soup and bread and butter and is given at a quarter to seven after which the children return home. The expenditure for the feeding amounts to about twelve cents per day per child. Poor children are excused from paying, and the others pay in full or in part according to the circumstances of their parents.

At Mülhausen four meals a day are provided; the hours being eight and ten-thirty A.M. and one and six P.M.

In the Gladbach school the children are given breakfast, lunch, supper, and half a pint of milk. Lunch consists of soup, meat, and two vegetables. The expenditure per day per child amounts to about fourteen cents. The food is supplied from a neighbouring sanatorium, which makes it much cheaper than it would otherwise be.



Dinner-time in the first English school at Bostall Wood. The donkey seen at the extreme right was one of the most popular members



At the Birley House School, Dulwich, England, meals are eaten out of doors in true picnic style

The same plan is followed in the school at Elberfeld, where the food is supplied from a neighbouring convalescent home. The children receive five meals a day, which include one quart of milk per child. The expenditure for feeding amounts to something less than sixteen cents a day per child. It is borne partly by the parents and partly by the charitable organization which manages the convalescent home.

When the first English school was opened at Bostall Wood it was decided that the children should be supplied with three good meals a day. The food was prepared at a cookery centre about a quarter of a mile from the Wood. The children received breakfast at nine A.M. immediately after arriving; dinner at half-past twelve; biscuits and fruit at three-thirty; and tea at five-thirty. The dietary was as follows:

BREAKFAST ON ARRIVAL

Oatmeal porridge (medium Scotch meal)
Syrup
Milk, $\frac{1}{2}$ pint

DINNER AT 12:30 P.M.

Meat (4 ozs.); fish occasionally

Potatoes (6 ozs.)

Green vegetables in quantity

Pudding (6 ozs.) in rotation:

Suet pudding and treacle

Milk pudding

Stewed fruit, or fruit in batter, or boiled rice

3:30 P.M.

Fruit or biscuit

TEA, 4:45 TO 5:15 P.M.

Weak tea (mostly milk)

Bread and butter

Jam or syrup twice a week

Cake, or currant bread and butter, twice a week

The good conduct of the children at meal-times was particularly noticeable. Before the close of the term they acquired a taste for good food and such diet as oatmeal porridge and green vegetables, which they were not accustomed to and refused to eat during the opening days of the experiment.

At the Thackley school at Bradford only three meals a day were provided. The physician in charge did not approve of the German practice of supplying food more frequently. For breakfast at nine o'clock the children had porridge, syrup, half a pint of milk, brown or white bread and butter. The first morning many of the children refused to eat the porridge or would take only a mouthful or two. In a few mornings, however, it was enjoyed by practically all of them. Dinner came at 12:30 and was cooked on the premises. The menu varied from day to day, the first and second courses being chosen from among the following:

First Course — Scotch barley broth; tomato soup; meat and potato hash; Shepherd's pie, gravy and green peas (or carrots and turnips); Yorkshire pudding, with gravy and green peas; cottage pie (meat and potato, with crust) and green peas; stewed beef, with onions, carrots and turnips; stewed fish, parsley sauce, mashed potatoes and green peas.

Second Course — Sultana or jam roly-poly pudding; fruit tart; baked currant pud-

ding and sweet sauce; baked jam roll; boiled fruit pudding (plum or apple); milk pudding in variety with stewed fruit; boiled rice and sultanas; cornflour blancmange.

Tea at 5 P.M. consisted of milk ($\frac{1}{2}$ pint); bread (brown or white); butter or jam; wholemeal cake occasionally.

American practice up to the present time has differed little from that of the English and German schools. In the open-air school maintained in Chicago during the summer of 1909 the children reached the school at 8:30 A.M. Their first duty was to give their faces and hands a thorough washing. Breakfast was served at nine o'clock in the school basement. This consisted of well-cooked cereal or shredded wheat, eggs in some form, bread, butter, milk, and often some kind of fruit. At first liberal amounts of cream were given with the breakfast food, but experience soon showed that too much cream was unpopular. It was a new article of diet and the children did not like it. In this as well as in other articles of diet it was found that the simple

foods, well cooked and nutritious such as had come under their range of experience at home, were far more acceptable than a more elaborate bill of fare.

At 10:45 in the forenoon refreshment of milk or eggnog was served. At first raw eggs were tried, but after a near-revolt on the part of the children various devices were practised to disguise the taste of the egg.

At 12:30 came dinner, which was the heavy meal of the day, usually consisting of meat or fish, potatoes and one other vegetable followed by pudding, fruits, cookies or some other sweets.

At three o'clock came the mid-afternoon refreshment of milk or eggnog, and at five o'clock supper was served, consisting of bread and butter, scrambled eggs or some similar food, custards or stewed fruit. The cost for feeding, including three meals and two refreshments per day, was just under thirty cents per day per child.

At the Providence school no attempt at full feeding is made. The children arrive at the school at nine in the morning and

the session closes at 2:30 in the afternoon. At 10:30 they have a recess during which they are given hot soup. At twelve o'clock they are all seated about tables, eat whatever lunch they have brought and in addition are given a hot pudding such as tapioca or rice served with cream and hot chocolate or cocoa made with milk. The menu for one week was as follows:

MONDAY—10:30, beef soup with rice. 12: pudding, cream of wheat, 3 quarts of milk, 6 eggs, served with cream; chocolate, all milk.

TUESDAY—10:30, beef soup with macaroni. 12: pudding, tapioca, 2 quarts of milk, 6 eggs, whipped cream; chocolate, all milk.

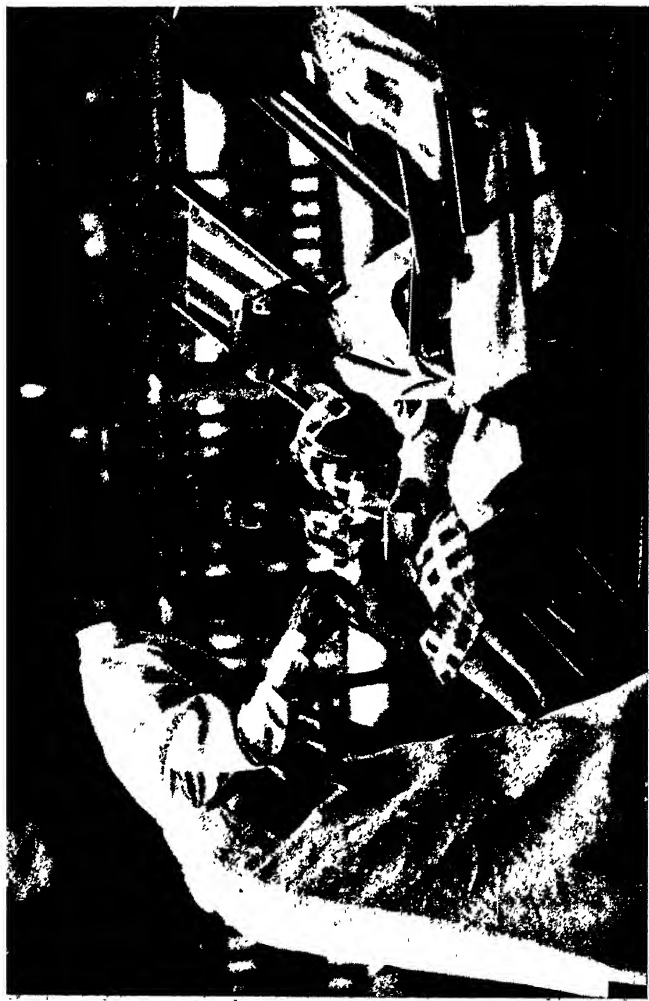
WEDNESDAY—10:30, tomato bisque soup. 12: rice pudding, 3 quarts milk, 6 eggs, served with cream; chocolate, all milk.

THURSDAY—10:30, beef soup with vegetables. 12:00, baked farina pudding, 3 quarts of milk, 6 eggs, cream; chocolate, all milk.

FRIDAY—10:30, pea soup. 12:00, prune pudding, 3 quarts milk, 6 eggs, served with cream; cocoa, all milk.



Hot soup at recess time, Providence



Forenoon refreshment in the Chicago school

The school maintained in Boston during 1908-9 was of a distinctly different type from the one at Providence. Boston's school was for tubercular children. They were present several hours longer than were the Providence children and a much more definite attempt was made to supply them with complete and adequate meals. The daily routine with respect to feeding was as follows: The children arrived at the school at 8:30 and had breakfast. After breakfast all but four were ready to begin lessons. These four, remaining in the dining room, cleared the tables, washed and dried the dishes, etc. At 12:30 dinner was served, and again the children helped to set and wait on the table. At 4:30 a light supper was served, and at five o'clock the children returned home. Cleanliness was insisted upon, and one of the rules of the school was that faces and hands must be washed before and teeth brushed after each meal. The diet was a simple one and so planned as to give variety and the proper amount of the different food constituents. The following are two

simple menus with their approximate food value:

BREAKFAST

Cocoa, bread and butter, sliced banana.

LUNCHEON

Stew of rice and mutton, bread and butter, milk, dessert, figs.

SUPPER

Milk, gingerbread.

	Amt. ozs.	Proteid	Fat	Carbo- hydrate	Calories
Cocoa (2 cups) .	18	19.06	23.42	37.86	451.17
Bread	4	10.5	1.3	59.7	301.
Butter	1	.24	28.7		221.
Banana (1) . .	3-4	.85	.42	15.2	77.18
Rice and mutton .	10	46.8	29.2	37.	619.
Bread	2	5.2	.06	29.8	150.
Figs (3)	2	2.61	.18	45.11	
Milk (3 glasses) .	26	24.93	30.22	37.77	532.
Gingerbread . .	2	5.22	5.73	40.3	235.6
	68	115.41	119.23	302.74	2589.95

BREAKFAST

Cocoa, Graham gems, butter, stewed prunes.

LUNCHEON

Creamed codfish, mashed potato, bread, milk, dates and nuts.



Dinner time at the Franklin Park School, Boston



Lunch hour at Hartford



Dinner hour on the *Southfield*, New York City

SUPPER

Milk, crackers, and cream cheese.

	Amt. ozs.	Proteid	Fat	Carbo- hydrate	Calories
Cocoa (2 cups) .	18	19.06	23.42	37.86	451.17
Bread	2	5.2	.06	25.8	150.
Butter	1	.24	23.7		221.
Graham gems . .	4	7.5	3.	44.	245.3
(Dry) prunes . .	1	.4		17.05	71.9
Creamed codfish .	4	19.	9.	19.9	265.
Mashed potato . .	4	3.	5.	18.	125.
Peanuts in shells .	1½	7.	10.5	6.7	155.
Dates (6)	1½	.31	.8	24.78	111.4
Crackers	2	4.64	3.2	33.8	186.8
Cheese	$\frac{5}{8}$	4.22	5.49	.39	69.9
Milk (3 glasses) .	26½	24.93	30.22	37.77	532.
	66	95.50	114.39	270.05	2584.47

In addition to the meals taken at the school, the children have milk and bread, or cereal and milk, or sometimes an egg before leaving home in the morning, and again a light meal on their return home at night. This brings the total fuel value of the food eaten during the day up to about 3,000 calories, which is probably high for a normal child, but not for these tubercular children.

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COST

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CHAPTER VII

COST

IT IS impossible to make a definite general statement as to the cost involved in the establishment of an open-air school because so much depends on local circumstances. In some places the question of a site may be a somewhat serious one. In England and Germany it is felt that it is almost necessary to have the school some distance away from the city or town and yet at the same time to have it easily reached by electric-car lines. If the same practice were followed in this country it would almost invariably involve a considerable search and decided expense. It must be remembered, moreover, that, whatever the outlay may be, it is always in addition to what is already being spent for school purposes, as no other schools or classes are closed because an open-air school is established.

The cost of maintaining the school as compared with the cost of an ordinary school will largely depend on how far food, clothing and carfare are provided for the children. The increased cost for the salaries of the teachers may easily be computed in any locality on the basis that teachers of the very highest class are needed and that there must be one teacher for approximately every twenty children.

The other increases in running expenses will be largely for food and clothing. The necessary expenditure for clothing will vary according to the suitability and amount of clothing the children bring from home, and in a similar way the cost for food will largely depend on how great a deficiency in the home supply must be met. No general rules can be laid down beyond the imperative one that it is absolutely essential that the children be supplied from some source with an abundance of suitable clothing and plenty of wholesome food of the right kind.

Probably because of the varying factors which enter into all the considerations of cost in relation to the new schools the information

as to cost furnished in their reports is mostly general in character. This will be seen on examining the figures published in the report of the parent school in Germany.

The Charlottenburg experiment was carried on for three months and began with ninety-five children, a number which was afterward increased to one hundred twenty. The following table gives some details of the total expenditure during this time:

Schoolrooms	\$2,430
Open shed	315
Washing and bathing room	218
Offices	243
Water and drainage	243
Milk and vegetable cellars	73
Wire fence	131
Internal equipment	1,215
Educational equipment	291
Provisions	1,336
Additions to teachers' salaries	111
Doctor's fee	73
Two cooks and two scullery maids	87
Tramway fares	82
Total	\$6,848

It is to be noted that only the last five items, amounting in all to a total expenditure of \$1,689, can properly be considered running expenses. The other items come under the head of permanent investment. Another point which must not be overlooked is that the salaries of the teachers are not included. The cost of food amounted to about twelve cents per child per day. For this sum five meals per day were provided.

Turning now to the first English experiment at Bostall Wood we find that the school took care of an average of eighty children in actual attendance for seventy-eight days. The expenses were as follows:

SCHOOL EXPENSES

Salaries of teachers (one principal and four teachers)	\$815
Janitor	119
Books, etc.	79
Furniture, etc.	348
		<hr/>
		\$1,361

COST

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FEEDING

Food	\$868
Cook and helpers	95
Fuel	9
	<hr/>
	\$972

OTHER EXPENSES

Nurse	\$120
Sanitary arrangements	161
Travelling (children)	192
Travelling (teachers)	49
Boxes for storing school property	62
Miscellaneous	32
	<hr/>
	\$616
Total expenditure	2,949

A computation based on the above figures shows that the cost of food, including the expense for fuel and for the wages of the cook and helpers, amounted to a little less than sixteen cents per day for each child. For this sum four meals a day were provided.

Turning now to America, there is even less definite information available. The report of the Boston school gives the infor-

mation that the cost for the school teachers and the school equipment is about the same as it would be in any other school. The cost of the raw food for each child is about twenty cents a day, and the cost of preparing and serving it together with all of the other expenses included beyond the school expenses is about thirty cents a day. It is stated that with the school running on a larger scale these figures could be reduced. These Boston figures were based on the expenses for a school of about forty children.

More detailed figures are available in the case of the school maintained in Chicago in 1909 by the Board of Education and the Chicago Tuberculosis Institute. Here thirty children were cared for for one month. The cost of maintenance of this school, is given as follows:

COST OF MAINTENANCE

(Not including Teaching Service and Equipment)

Transportation	\$46.30
Cook and helper	30.90

Half-time salary of nurse . . .	35.00
Food — Bread, crackers, and cookies	\$15.35
Milk and cream	68.90
Butter and cheese	10.42
Eggs	44.03
Groceries	13.59
Fruits and vegetables	22.91
Meat, poultry, and fish	14.25
Ice	4.00
Sweets85
	<hr/>
	194.30
30 tooth-brushes at 20 cents . . .	6.00
Miscellaneous expenses	8.96
	<hr/>
Total cost	\$321.46

Cost per child per day:

For food { 3 meals 2 refreshments }	29.4 cents
For transportation	7.0 cents
For service and other expenses	12.3 cents
	<hr/>
Total	48.7 cents

To sum up, the added cost of maintaining an open-air school will depend on the necessary local expenditure for securing quar-

ters, employing unusually capable teachers in the ratio of one teacher for every twenty or twenty-five pupils, and supplying necessary clothing and food of good quality but simple character. Indeed, in the entire matter of equipping an open-air school simplicity should be the keynote.

This does not necessarily mean that the buildings should be of flimsy temporary construction or lacking convenience or suitability. Much less does it mean that economy of a parsimonious sort can be for a moment tolerated in supplying necessary food and clothing. It does mean that no allowance whatever should be made for ostentatious display or luxuries.

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CONSTRUCTION AND CLOTHING

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CHAPTER VIII

CONSTRUCTION AND CLOTHING

PROBABLY no one man has made a more thorough technical study of the construction of hospitals and sanatoria for the tubercular than has Dr. Thomas S. Carrington, Assistant Secretary of the National Association for the Study and Prevention of Tuberculosis, and Expert on Hospital Construction in the New York State Department of Health. It is because his professional equipment enables him to speak with authority that the material presented in this chapter has been largely taken from an article by Dr. Carrington entitled "How to Build and Equip an Outdoor School," published in the *Survey* for April 23, 1910; and from other information furnished through his courtesy.

CONSTRUCTION

Open-air schools, as we find them in America, may be divided into two general classes. In the first of these we may include those open-air schools which are carried on in buildings exclusively devoted to the purpose. In practice these buildings are generally simple and often temporary in character. Open-air schools of the second type may be classed under the heading, "fresh-air rooms." These are schools conducted in the rooms of school buildings which have been altered to suit the new requirements.

Turning to the schools of the first class, which are conducted in buildings exclusively devoted to the purpose, we find them ranging in building equipment all the way from the comparatively elaborate plants found in the forest schools of Germany and England to the buildings on unoccupied country estates which have been used both abroad and in this country, and to the extremely simple temporary buildings which



Class and roof building, Franklin Park School, Boston, Side curtains lowered to secure picture



Photograph of the Chicago roof tent, as published by *The Survey*, to illustrate permanent construction

have been erected on the roofs of school and other buildings in Boston, New York, and Chicago.

These small buildings, of a size to accommodate not more than twenty-five or thirty pupils, are little more than permanent tents built partly of wood and partly of other materials. The following description of the construction of a New York building gives details which may be considered typical:

The building is 30 feet long, 20 feet wide, and 12 feet high at the highest point of the roof and can be built at a cost of about \$500. It is in the shape of a rectangle with a flat roof. The roof is supported by 4-x-4-inch timber posts at the corners and at the centre of the end walls. These uprights are reënforced by 2-x-4 joists placed 4 feet apart on all sides of the building, while the roof support consists of a 3-x-6 timber girder running the length of the room and supported by a post in the middle. The roof consists of tongued and grooved inch boards laid on rafters and covered with rubberoid roofing. The floor is made

of narrow floor boards laid on 2-x-4 supports and covered with battleship linoleum. The four sides of the room are enclosed by board walls up to a height of 3 feet from the floor. Above this the north and west sides are enclosed by alternating panels of narrow boards and long windows hung from the ceiling.

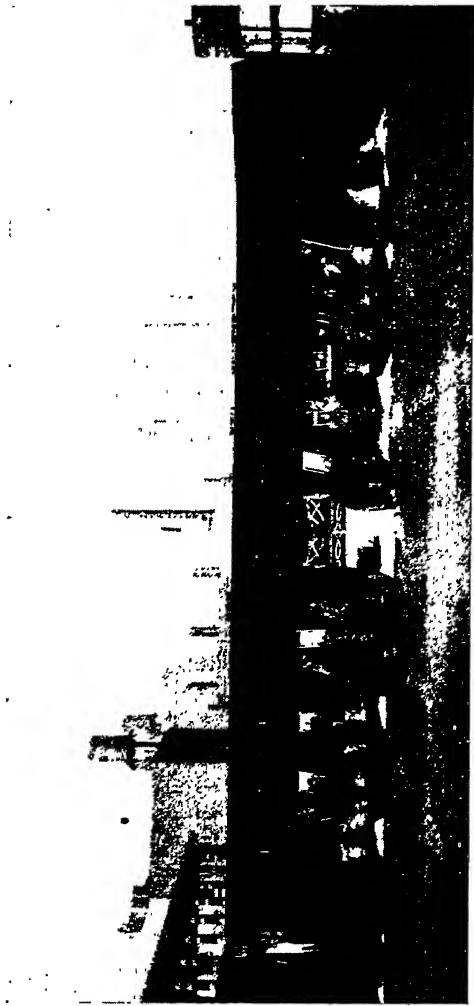
The south and west sides are open above the wainscoting, but protected from wind and storms by canvas curtains on rollers which carry them entirely out of the way when not in use.

In cities where the wooden construction is forbidden by the building or fire regulations, asbestos board siding may be substituted for wooden siding. This construction has proved successful in the Chicago school. Experience shows that the children can comfortably live in the open air even at very low temperatures if they are thoroughly protected from the wind.

Even such simple and inexpensive buildings as these have not been found necessary in all cases. In Chicago, Boston, Hartford, and Rochester the first open-air schools



Open air — open minds
Used by *The Survey* to illustrate class-work in the Chicago school



Wind shelter at the New York School Farm. To secure comfort protection against wind is more essential than heating

were housed in tents, and this practice is still maintained in the Connecticut city. There is, however, an unoccupied dwelling-house available which is utilized for shelter during very inclement weather. The kitchen facilities are also used for preparing the food, and one of the upper rooms with wide-open windows has been used as a sleeping room during the rest hour of the children.

It would seem that the experience of Hartford in utilizing the unoccupied dwelling-house on an estate provided with ample grounds might be followed in many other places where the temporary use of the property might be available without the necessity of purchasing it.

Another useful lesson in constructive economy is to be found in what New York has done in utilizing abandoned ferry-boats for open-air classes. Perhaps no better illustration can be found of putting an apparently useless piece of property to a useful service.

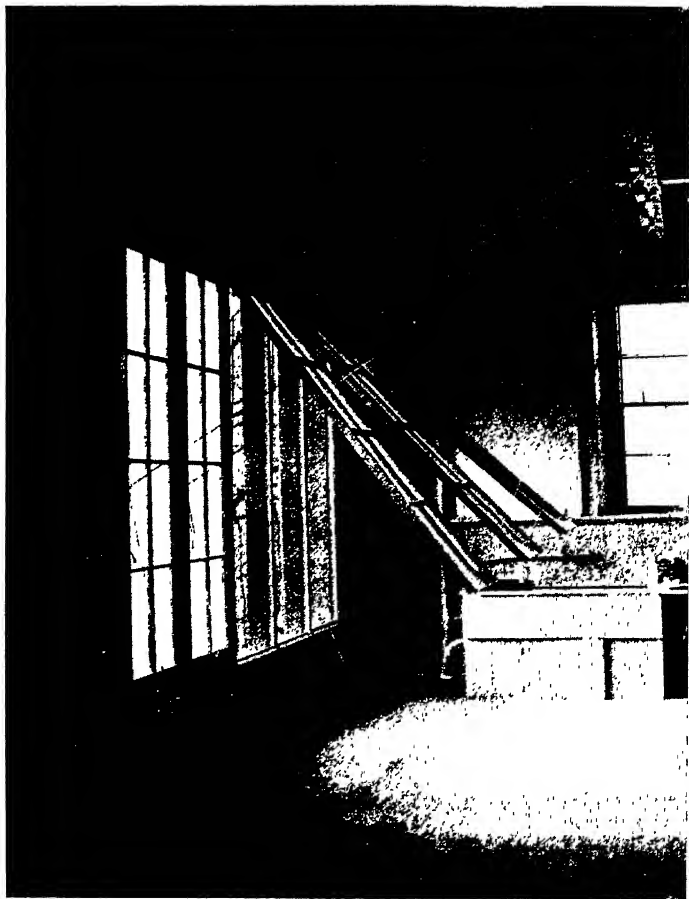
The second class of open-air schools consists of schools conducted in what we

have called "fresh-air rooms." The expedient of remodelling existing schoolrooms so that they will serve for the fresh-air classes has the great advantage of making it possible to start work wherever there is a room available in one of the public school buildings. The experience at Providence shows that such a location may at times be found in school buildings which have been abandoned by the regular classes, but may be remodelled for the new use at comparatively slight expense. There must be in many cities similar old school buildings which can easily be utilized.

The best way to fit the schoolroom for the new use seems to be first to choose a room with a southern exposure and then to remove the outside wall on that side so far as possible. This operation converts the four-sided schoolroom into one of three sides. The fourth side is then filled in with long windows reaching clear to the floor and hinged at the top and provided with pulleys and cords so that they may be raised against the ceiling of the room on the inside.



The Hartford school in an army tent in February



The windows in the Providence school are hinged at the top and can be raised against the ceiling by cords and pulleys

A less expensive way is not to attempt to remove the entire wall, but simply to cut the existing windows down to the floor level and provide the openings with window sashes hinged from the top. A still less expensive expedient, but one that is not as satisfactory, is to leave the window openings as they are and simply to substitute for the present sliding sashes full-length hinged sashes.

However the alterations may be made, experience shows that it is best to seat the children in movable chairs so placed that the children's backs shall be toward the open side of the room.

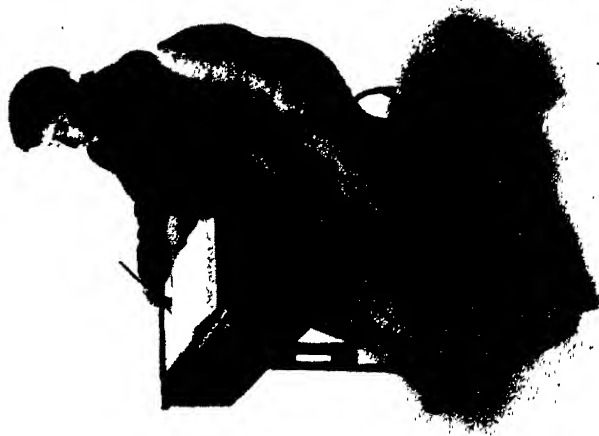
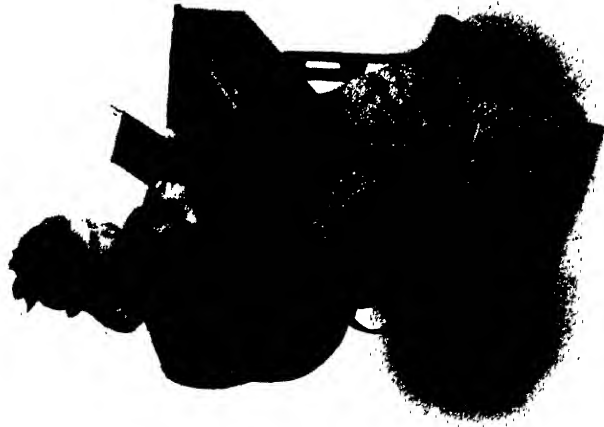
In buildings provided with mechanical heating and ventilating systems the intakes are cut off and hand regulations substituted for the automatic mechanism. The Providence experience shows that in buildings where no heating plant is in operation a satisfactory substitute may be provided by installing an old-fashioned heating stove in the schoolroom. The consensus of opinion among those who have had experience with the new schools is that the temper-

ature should not be allowed to fall much lower than forty degrees Fahrenheit even in the coldest weather.

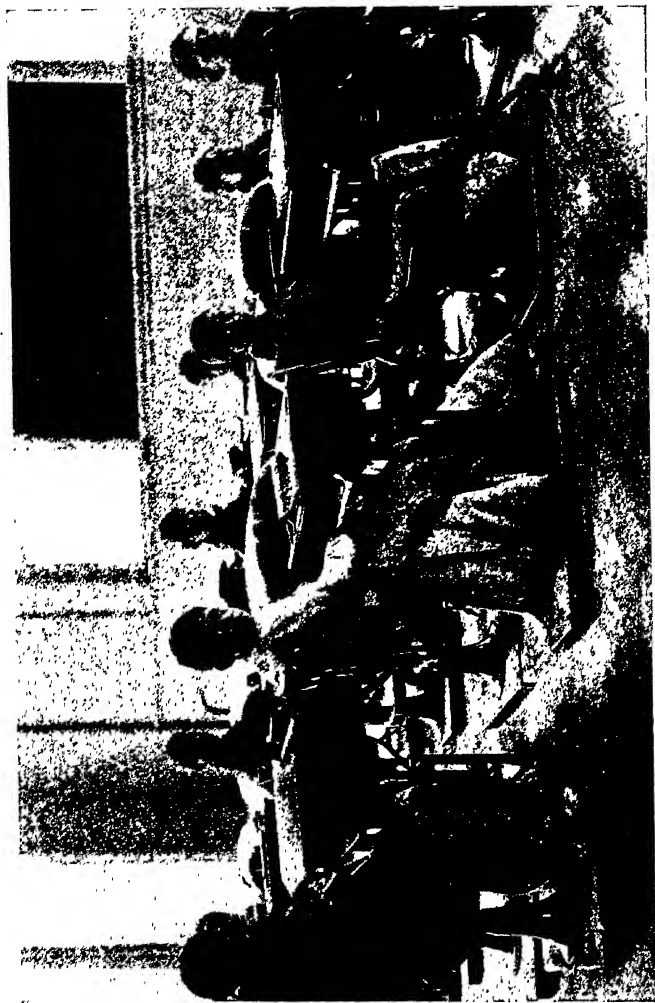
All of the experiments that have so far been conducted show that the changes necessary to convert an existing schoolroom into a fresh-air room are comparatively simple and inexpensive in either old or new buildings. In schools in course of construction still better arrangements can be made, and fresh-air rooms with two or three sides open to the weather may be constructed.

CLOTHING

There is unanimous agreement on the proposition that if children are to benefit from the open-air treatment they must be well fed and kept warm. Keeping them warm in rooms where the temperature is frequently low can only be accomplished by providing them with sufficient clothing of just the right sort. If they do not possess good woollen underwear and warm well-fitting outer garments these must be supplied



With sitting-out bags, soapstones, heavy outer clothing, children are comfortable even in the coldest weather. Providence



Some Providence children equipped with sitting-out bags

directly by the school or indirectly by some charitable agency.

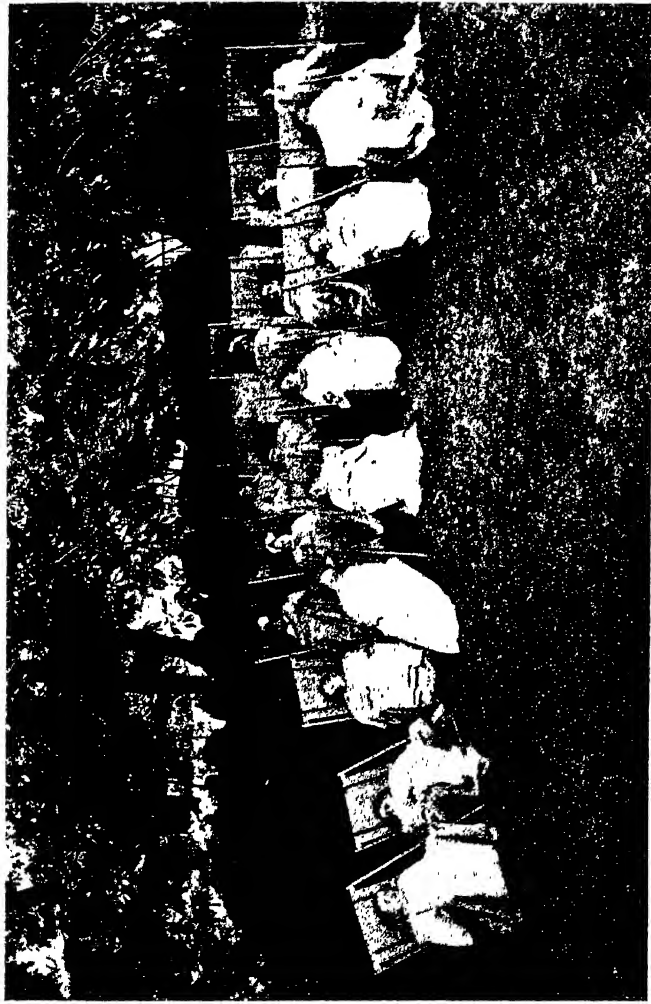
It is absolutely essential that each child be provided with a heavy overcoat, sitting-out bag, two blankets, a knitted toboggan cap, and warm gloves. If a child comes to school with his shoes and stockings damp they should be removed and others belonging to the school substituted. In the Providence school low felt shoes have been found most satisfactory for such use. In the school now maintained on the roof of the Mary Crane Nursery in Chicago the children are provided with Eskimo suits which have proved satisfactory for the purpose and are unusually attractive in appearance.

Several of the schools have found it advisable to provide soapstones or hot-water bottles which are placed at the children's feet in very cold weather. Some difficulty with the use of the soapstones has been found in Providence, where experience showed that the thin, poor soles of the children's cheap shoes were rapidly cracked and ruined by the effect of the heat from

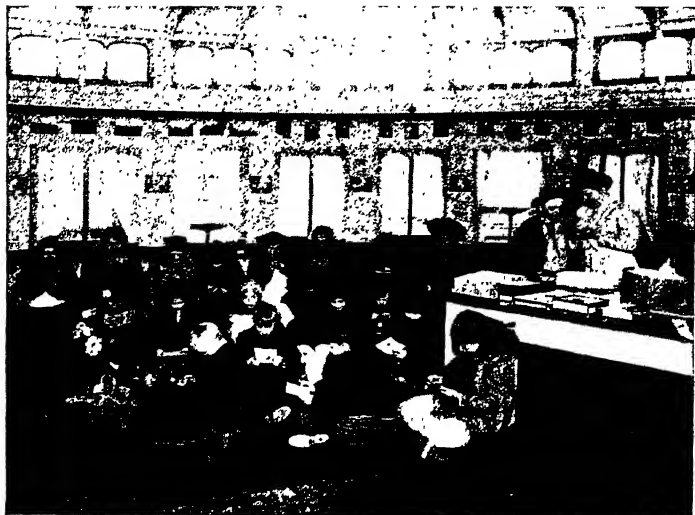
the stones. This has been obviated by having the child take off his shoes and replace them with the felt shoes belonging to the school.

One device which has proved very successful in keeping the feet of the children warm is to provide each child with a wooden foot-box about two feet long by a foot and a half wide and a foot high. These foot-boxes are usually lined with quilting or some other padding, and a hot soapstone or water-can is placed in the bottom under the feet when necessary. These boxes have been found to furnish the best arrangement for keeping the children's feet warm on very cold days.

Sitting-out bags may be purchased from dealers in sanatorium equipment or made as required. A Boston firm is now furnishing them for about \$3.00 each. The sitting-out bag is made of heavy blanketing and covered with brown canvas. They are cut and stitched so as to conform with the shape of the chair and attached to it by tape at different points to prevent the child in the bag from slipping off.



Rest hour, Franklin Park, Boston. Silence enforced, sleep encouraged



Handwork receives as much attention as health and head work on the *Southfield*, New York City



Tables and chairs are substituted for desks and seats in the fresh-air rooms of the Graham School, Chicago

Experience has shown that the children are very apt to regard these bags as ideal places for collecting and guarding a miscellaneous collection of the treasures of childhood, including food supplies, which they store up for future possible need. This propensity of the children constitutes a genuinely serious objection to sitting-out bags. Another objection is that a bag which is shaped to the chair is not convenient for use in reclining-chairs or when the child is lying in bed.

In order to overcome these objections Dr. Carrington has developed a simple cheap bag which can be made at home or manufactured in large quantities at a low price. This bag is so arranged that it can be opened out flat for brushing and airing, and when closed and buckled it is perfectly tight and wind-proof. Such a bag is a great improvement over the old-style sewed-up bag.

The Rhode Island State Board of Health loans upon application a miniature model of a sitting-out bag with the following directions for making:

The sitting-out bag should be made to suit the patient — a small one for a child, and a longer one with more turned up at the bottom for a tall person. Obtain the following materials:

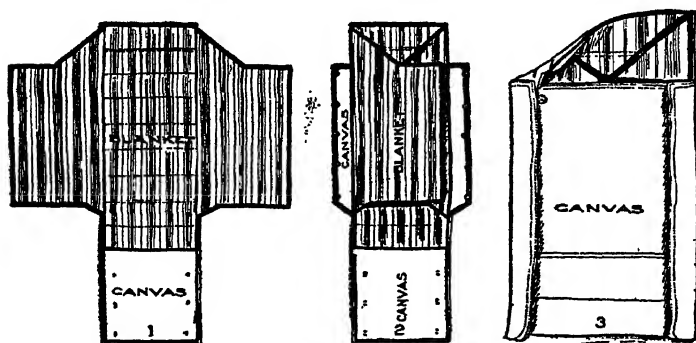
7 yds. outing flannel	\$0.70
6 rolls cotton batting60
1 spool linen thread10
1 piece of braid.10
6 or 7 layers of newspaper		

The flannel should be spread on a flat surface and one-half of same covered first with batting; second, six or seven layers of newspapers; third, a second layer of cotton waste. Spread the other half of the flannel over this, tack with a strong thread like a mattress, and stitch all around the edge.

You now have a long strip which should be turned up at the bottom $1\frac{1}{4}$ yards. Sew up the edges 25 in. Attach tapes to top of flap and to top corners of bag.

While arrangements are being made to provide for the comfort of the children in the open-air school the teacher should not be forgotten. She should be provided with a long heavy wool or fur coat, a fur cap and

mittens, and felt shoes. There should also be laid under her chair a piece of thick



Dr. Carrington's Sitting-out Bag

carpet or rug to help in protecting the feet, and in very cold weather she is likely to find a foot-box a comfortable addition to her equipment.

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FORMS FOR RECORD-KEEPING

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CHAPTER IX

FORMS FOR RECORD-KEEPING

SO FAR few forms have been developed for keeping the individual records of the pupils in open-air schools. That such forms are needed is clear, and it is equally certain that they must be adapted to the peculiar conditions maintaining in the new class of schools. They must be primarily records of progress, not mere statements of such commonly kept data as enrolment, attendance, class standing, etc., nor even records which will only record the physical condition of the children upon entering or at one or two stated times during the school year. The one important question is whether or not children are steadily making progress, and, above all, physical progress.

Diligent inquiry among open-air schools now in operation has brought to light only three record forms designed to record such

facts. The Providence and Chicago schools are using individual cards for recording the facts about each pupil, and in Hartford a weight chart is used which shows in graphic form the fluctuations in weight of each child from week to week.

Facing page 141 is a facsimile of one of the Providence cards filled in with data concerning one of the children of that school.

As a mere record of social and physical facts it seems very well adapted to its purpose. It is not, however, so designed as to record progress satisfactorily.

The reverse of the card is simply ruled horizontally and in columns, and it is the practice of the school authorities in Providence to record in these spaces the results of the periodical weighing and the hæmoglobin tests. The card does not, however, provide for any uniform method of recording these data.

Something of an improvement over the Providence card is found in the form which was used in the Chicago school in the summer of 1909. As it was realized at the outset



Fresh-air fends in the Graham School, Chicago.

MEDICAL INSPECTOR'S RECORD

Name *Flourne Anderson*

Address *87 Smith Street*

Family History *Father died of tuberculosis 6 years ago*

Personal History *Wheezes, scarlet fever, whooping cough*

William Street

School

Date *January 27, 1908*

Age *5 years*

Parent's Name *Mrs Margaret Williams (aunt)*

Another child of cancer

Not strong, recently being night

PHYSICAL EXAMINATION

Eyes *Sts. 24. Left 28. Right 28. Enlarged head, acute*

Teeth *6 badly decayed*

Pharynx *Normal*

Glands *Low palpable cervical gland on st. side - edge of chestnut*

Deformities *None*

Heart *Normal*

Lungs *Clear bronchial rales at right posterior region*

Circumference of Chest { Inspiration *23 1/2*
Expiration *24 1/4*

Chest Expansion *1 1/4 inches*

Individual record card used at Providence

that this was merely a summer school and would be maintained for a short term only, the card was designed to record the facts for each child for a term of six weeks. It served this purpose very satisfactorily, but could not be so adapted as to serve for an entire school year. A facsimile of this card is shown on page 142.

A valuable feature found in the Providence card, but absent in the Chicago one, is the provision for recording the family history and the personal history of the child.

One form in use in the school of Hartford, Connecticut, is an improvement over the forms already considered in that it provides for a graphic representation of one most important datum: the fluctuations in the weight of each child. No attempt is made in this form to register anything else than facts respecting the child's weight. The chart is extremely simple. It consists of a form ruled horizontally and vertically, each horizontal space corresponding to one pound in weight and each vertical space to one week in time.

Thus in the case of Camella, whose weight

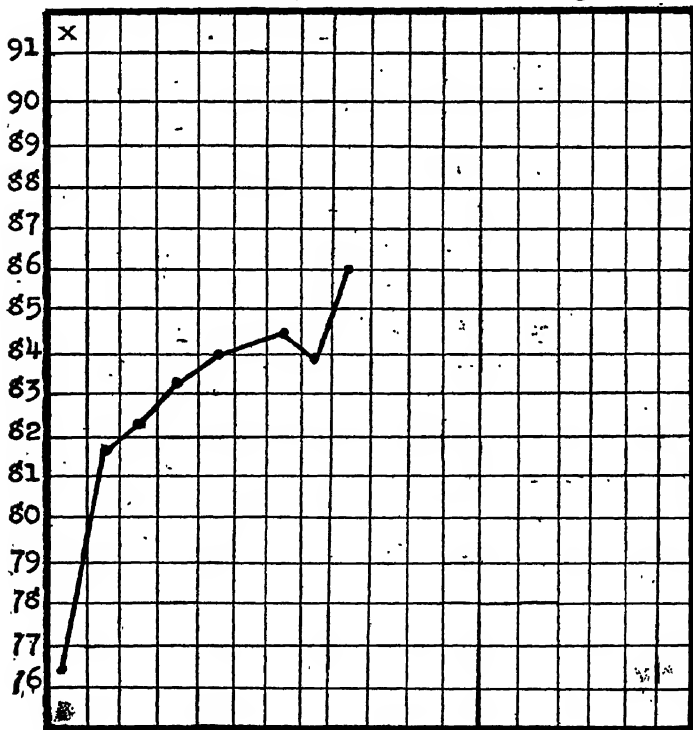
RECORD CARD—CHICAGO OPEN-AIR SCHOOL

Name, <i>Schmitt, Anna</i>	M F ✓	Age, 12	Parentage, <i>German</i>					
Address, — <i>Broad St.</i>	Occupation,		Father, <i>Carpenter</i>					
In school, <i>Yes</i>	Grade, <i>6th</i>		Mother, <i>Housework</i>					
Tuberculous, <i>Pul.</i>	Stage, <i>1st</i>	Active Inactive ✓	Physical condition, <i>Below normal</i>					
			Latent	Predisposed				
	Weight	Temp.	Pulse	Skin	Muscle	Teeth	Chest Exp.	Gen. Cond.
On admission . .	87½	99.6	88	Pale	Flabby	Good		
First week . . .	89½	98.6	80					
Second week . . .	89½	98.4	88					
Third week . . .	90½	98.6	92					
Fourth week . . .	91½	99.0	96					
Fifth week . . .	94½	98.6	96					
One mo. after dischg.	93½			Good colour	Im- proved			
On discharge . .								

REMARKS: *On admission*—Appetite poor, very nervous and restless.
On discharge—Appetite good, nervousness practically disappeared.

chart is reproduced, the weight upon entering the school in the week beginning January 3 was $76\frac{1}{2}$ pounds. A dot was made in the square of the chart corresponding

WEIGHT CHART. HARTFORD OPEN-AIR SCHOOL
Name, *Camella A.* Age, 12 years Normal Weight, 91.2



to this weight and to the first week to record this fact. When Camella was weighed during the second week she had so increased in weight that she weighed nearly 82 pounds. A dot was placed in the corresponding square of the chart and the two dots connected by a line. This process, repeated each week as time went on, shows that she steadily increased in weight for the first six weeks, lost in the seventh, and increased again during the eighth week.

In the upper left-hand corner of the chart there is a small cross just above the 91-pound level. This indicates that the school authorities considered the normal weight for a girl of Camella's age to be 91.2 pounds, and that the difference between this weight and the weight actually recorded shows the degree to which the girl was below normal weight.

In this process of reporting progress an upward trend of the line from week to week indicates that all is going well, whereas a downward trend means that there is something wrong and something needs attention. The record of the normal

weight, which may be regarded somewhat in the light of an ideal to which it is aimed to raise the child, is interesting, but of doubtful value. The normal weight for a certain age, as the term is generally used, simply means the average weight which is secured from the recorded weights of a great many individuals all of a given age. While such a figure is interesting and has its uses, it may not be at all valuable as an indication of the best possible weight for any given individual.

Two interesting forms are used in the Franklin Park School in Boston. The first is a personal record sheet which is filled out by the child himself every day and has on it sufficient spaces so that one sheet lasts for one week.

The headings under which the child makes his entries each day are eloquent testimony of some of the fundamental differences between open-air schools and those of the conventional type. The fact that the child records such things as the hour of sunset, the direction of the wind, reading of the thermometer, as well as data

PERSONAL RECORD—FRANKLIN PARK SCHOOL

Day					
Hour					
Sunrise					
Sunset					
Length of day.....					
Gain or loss in day.....					
Direction of wind					
Kind of clouds.....					
Precipitation					
Rain gauge.....					
Weather report.....					
Moon's phases					
Evening star					
Morning star.....					
Comet, when seen.....					
Reading of thermometer.....					
Movement of bowels.....					
Times urinating during day.....					
Cough?.....					
Raise?.....					
What I ate for supper at home.....					
What I ate for breakfast.....					
What I do when I get home.....					
Report of matron					

PERSONAL TERM RECORD—FRANKLIN PARK SCHOOL

Date						
Absent						
Tardy						
Car record						
Weight						
Height						
Glasses needed						
Hearing { Rt.						
{ Left						
Baths at home						
Baths at school						
Suitable clothing						
Care of school coats, hats, mittens, wristers						
Walks for observation						
Games and free play						
Breathing exercises						
Bag drill						
Wash room						
Care of paper bags						
Care of teeth						
Care of nails						
Deportment						
Time in reclining chair						
Truant						
Manual training						
Cooking						
Scholarship						
Sent to principal						

concerning his physical well-being, shows how different an aspect school work takes on under the new conditions.

The second of the forms mentioned is the personal term record which is filled out by the principal and which has spaces for recording the essential facts about each child for one-half of the school year. Here again the information recorded is of a kind entirely novel in ordinary school practice.

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THE NEED FOR OPEN-AIR SCHOOLS

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CHAPTER X

THE NEED FOR OPEN-AIR SCHOOLS

THE open-air school, as it has been developed in America, is primarily a school for caring for children who are suffering from tuberculosis or predisposed to the disease. In short, it is essentially a therapeutic agent for a special class of sufferers. In Europe the aim has been quite different and distinctly broader. This is indicated in the term "open-air-recovery schools," which is frequently used abroad.

The pupils for whom the schools have been designed abroad are physically debilitated children who are suffering from anæmia and various forms of incipient disease, but who are not necessarily even in the "pretubercular" class. They are children who are able to attend the regular schools and even to some extent to profit

from the instruction given, but whose vitality has been greatly impaired.

For these children the open-air-recovery school has been devised. Its province is to carry on the instruction of the children with the help of improved methods and surroundings while at the same time endeavouring to cure or ameliorate the ailments from which they suffer.

From the administrative viewpoint two questions at once arise. The first is that of cost, and the second, the question how many of these schools should be provided to fill adequately the existing need. The question of the expense of maintaining the schools is treated in the chapter on "Cost"; that of the indirect economies in lives and expenditure to be effected through establishing these new schools as preventive agents may well be considered here.

In the first place what do deaths of school children from tuberculosis cost us each year? According to the report of the United States Commissioner of Education for 1908 there are in the schools of this country, public and private, some 18,200,000

children. These children range in age from five to nineteen years. Recent studies show that about 43 per cent. of them are between the ages of five and nine, 50 per cent. between those of 10 and 14, and 7 per cent. between the ages of 15 and 19.

Now the reports of the Census tell us that deaths from all forms of tuberculosis among each 100,000 children are each year as follows:

Ages	Deaths per 100,000
5- 9	17.9
10-14	34.5
15-19	143.1

These data enable us to compute that the number of school children who die each year in this country from all forms of tuberculosis is about 6,400.

The average age at which these children die is about twelve and one-half years. We shall not be far wrong if we estimate that they have had six years of schooling each. This schooling has been paid for at the average rate of \$30 per year for each child. The money loss which is sustained

by the community in each case amounts to \$180 for schooling alone. The aggregate loss each year from this cause reaches a total of \$1,152,000. It is impossible to compute in money terms the loss in doctors' fees, wrecked hopes, and ruined homes, but enough has been told to indicate the serious character of the problem.

Turning now to the other side of the question, how many open-air schools should be provided to meet adequately the need which exists? The evidence from which we may answer the question is fragmentary but fairly consistent.

Dr. Frederick Rose, who is admittedly the foremost English authority on the subject, says that from 3 to 5 per cent. of all school children are of such a type that they may profit from instruction in open-air schools, but cannot properly be cared for in ordinary ones.

According to figures published in the tenth annual report of the City Superintendent of Schools of New York for 1908 physical examinations among more than 210,000 children in that city show that those suffering from malnutrition, cardiac

diseases, and pulmonary diseases amounted to 4 per cent. of all.

The report of the Department of School Hygiene of Boston for 1907 shows that the children suffering from malnutrition, anæmia, cardiac diseases, and tuberculosis constitute 2.25 per cent. of all the children examined.

The National Association for the Study and Prevention of Tuberculosis has issued a statement to the effect that investigations in Stockholm, Sweden, showed 1.61 per cent. of the school children were suffering from tuberculosis.

Medical inspection in Atlanta, Georgia, in 1909 showed that pupils suffering from malnutrition, anæmia, cardiac diseases, and tuberculosis were 5.8 per cent. of the total school membership.

A report on the schools of St. Paul for 1909 shows that children suffering from cardiac diseases and tuberculosis together were 2.7 per cent. of all.

A report from Appleton, Wisconsin, shows 3 per cent. of the children suffering from malnutrition.

The first selection of pupils needing open-air treatment in the Boston schools was made in the first part of the school year 1909-10. It has already been referred to in the chapter on "Open-air Schools in the United States." The result was that 5 per cent. of the children were found by the school physicians to be in need of the treatment afforded by the open-air classes.

In April, 1910, Dr. Henry R. Hopkins, chairman of the Committee on Open-air Schools of the city of Buffalo, New York, said that about 7 per cent. of the school children of that city needed the same sort of treatment.

All of these different pieces of evidence indicate that in the average city-school system the children who are in need of such treatment as that afforded by the open-air school constitute from 3 to 5 per cent. of the entire membership. It would probably not be far out of the way to say that of these at least one-third, or from 1 to 2 per cent. of all, are either definitely suffering from tuberculosis or are pre-tubercular.

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